COURSES

0901 FCAOP
The Fourth Class Academic Orientation Program (FCAOP) facilitates cadet transition from high school to college with a focus on self-assessment as a first step in academic success. Topics for discussion include study skills, anti-plagiarism, academic outcomes, and goal setting.
Credit Hours: 1.00
Format: Discussion
Projected Offering: Fall

0924 CONNECTICUT COLLEGE
Single-course exchange program with Connecticut College. Offers cadets an opportunity to enhance their background by enrolling in a free elective. Enrollment is normally limited to one semester and to a course not available at CGA.
Projected Offering: Fall and Spring

0925 SCHOLAR'S PROJECT
Independent study and research in an area of interest to the highly qualified cadet. It requires a major academic commitment of the cadet to problem definition, analysis, and evaluation. An oral presentation and written reports are required.
Projected Offering: Fall and Spring

0940 PEER TUTORING
A tutorial program which matches pre-selected cadet volunteers who have performed well in particular academic subjects with other cadets who need help. This program not only facilitates the academic success of students in need but also helps the tutor cadets develop good teaching skills. (Grading is Satisfactory/Unsatisfactory.)
Format: Tutorial
Projected Offering: Fall and Spring

0941 PEER TUTORING
A tutorial program which matches pre-selected cadet volunteers who have performed well in particular academic subjects with other cadets who need help. This program not only facilitates the academic success of students in need but also helps the tutor cadets develop good teaching skills.
Format: Tutorial
Projected Offering: Fall and Spring

1116 STATICS AND ENGINEERING DESIGN
An introduction to the techniques of engineering problem solving and design. The course includes individual and group design projects with written reports. An introduction to vectors, composition of forces and the drawing and use of free body diagrams. Applications of collinear, concurrent and non-concurrent two and three-dimensional equilibrium force systems, as applied to particles and rigid bodies. The study of equilibrium as it also applies to frames and machines, trusses and beams. The study of distributed force systems, concentrated forces and Coulomb friction as applied to structures.
Credit Hours: 3.00
Format: Class
Projected Offering: Fall and Spring

1204 ENGINEERING MATERIAL SCIENCE
Introduction to metallurgy for engineers with an emphasis in crystal structure and defects, dislocation theory, diffusion, mechanical properties, fracture, strengthening mechanisms, phase transformations, fatigue, creep, corrosion, welding, and various metal alloys. Lab experiments and demonstrations include: cold rolling and annealing, Charpy impact testing, Jominy end-quench, casting, forging, independent study, and field trips to local industry to relate theory to engineering applications.
Credit Hours: 4.00
Format: Class/Laboratory
Prerequisites: 1116 and 5106
Projected Offering: Spring

1206 STRENGTH OF MATERIALS
An introduction to methods of analyzing and designing various machines and load-bearing structures through means of understanding axial, torsional, bending, and combined stresses and strains as applied to deformable bodies. The plotting of shear, moment, and deflection diagrams with calculus applications and interpretations are utilized. Supporting topics in elastic behavior, ductile and brittle fractures are also included. Laboratory exercises: tensile testing, beam stress, beam deflection, and column buckling.
Credit Hours: 3.50
Format: Class/Laboratory
Prerequisites: 3117 and 1116
Projected Offering: Fall

1208 INTRODUCTION TO MECHANICAL ENGINEERING DESIGN
Techniques of engineering design and problem solving. Introduction to computer use in the design process including analytical tools and computer-aided design. Engineering drawing, sketching and visualization. Familiarization with manufacturing techniques. Study and practice of the design process through individual and group projects. Fundamental physical and mathematical concepts used in the design process, as well as the ethical and sociological considerations of technology. Design assignments address idea generation, modeling, and project management techniques including scheduling and economic analysis. Projects apply all of the aspects of problem solving, design, and reporting results.
Credit Hours: 3.00
Format: Class/Laboratory
Projected Offering: Fall

1211 DYNAMICS
Kinematics and kinetics of particles and rigid bodies in two dimensions under the effects of unbalanced force systems. Principles of force and acceleration; work and energy; impulse and momentum; damped and undamped single degree of freedom vibration. Engineering applications.
Credit Hours: 3.00
Format: Class
Prerequisites: 1116
Projected Offering: Spring

1218 ELECTRICAL ENGINEERING I
An introductory course in linear circuit analysis that develops the fundamental tools necessary for further success in the EE field. Students are introduced to the following topics: models of circuit elements; circuit analysis using Ohm's and Kirchoff's laws; nodal and mesh analysis; basic ideal operational amplifier circuits; Thevenin and Norton equivalent circuits, solution of first and second order circuits; phasor-based solutions to AC circuits; elementary frequency response. MATLAB is introduced and used throughout the course. An emphasis is placed on the formulation and solution of linear systems of equations, including a system of differential equations, through traditional and computer aided methods. This course builds upon the background gained in physics and calculus courses and prepares students for taking Signals, Systems and Transforms (1222), Digital Circuits and Computer Systems (1324), Antennas and Propagation (1420) and Linear Circuits (1322).
Credit Hours: 4.00
Format: Class/Laboratory
Prerequisites: 3117
Corequisite: 3215
Projected Offering: Fall

1222 SIGNALS, SYSTEMS AND TRANSFORMS
The study of continuous and discrete linear systems through signal analysis, singularity functions, convolution, Fourier transforms, Laplace transforms and Z-transforms. The formulation and solution of differential (and difference) equations by using transform techniques. The time and frequency domain analysis of linear systems via calculations, theoretical computer simulations using MATLAB software, and physical laboratory systems is examined.
Credit Hours: 4.00
Format: Class/Laboratory
Prerequisites: 1218 (or 1321) and 3215
Projected Offering: Spring

1224 INTRODUCTION TO COMPUTER PROGRAMMING

This course will introduce students to programming on two levels – the abstract and the concrete. At the abstract level we will discuss the programming principles of algorithm and flow of control, including sequential execution, selection, iteration, and subroutine. At the concrete level students will put principles into practice by writing programs in two modern programming languages: MATLAB® and C++. Laboratory work and programming projects will give students experience in both languages.
Credit Hours: 3.00
Format: Class/Laboratory
Projected Offering: Fall

1301 CIVIL ENGINEERING MATERIALS (T)

Special course in Material Science - concrete and asphalt - to accommodate transfers into the Civil Engineering Major for students who have completed 1204.
Credit Hours: 2.00
Format: Class/Laboratory
Prerequisites: 1204
Projected Offering: Fall

1302 CIVIL ENGINEERING MATERIALS

A study of the material and engineering properties (including manufacture, strength and mechanical characteristics) of concrete, asphalt, metals, and wood. Design of Portland cement concrete and asphalt mixes. The effects of fabrication, welding, heat treatment and corrosion on metals. Weekly laboratories include characterization of aggregates, mix design, casting and testing of concrete cylinders, Marshall stability tests of asphalt, metals testing, and two field trips.
Credit Hours: 4.00
Format: Class/Laboratory
Prerequisites: 1116 and 5106
Projected Offering: Fall

1304 SOIL MECHANICS AND FOUNDATION DESIGN

Study of the origin and characteristics of soil and rocks including the fundamentals of soil behavior, and its use as a construction material. The effective stress principle, one-dimensional settlement analysis, shear strength, and bearing capacity of soils. The stability of slopes and the design of retaining walls. Laboratory tests include Specific Gravity, Mechanical Analysis, Compaction, Field Density, Consolidation, Direct Shear, and Triaxial Shear.
Credit Hours: 4.00
Format: Class/Laboratory
Prerequisites: 1116
Projected Offering: Spring

1309 ENVIRONMENTAL ENGINEERING I

Introduction to the field of environmental engineering. Fundamental principles from chemistry, microbiology, hydraulics, and hydrology are applied to study the occurrence and fate of pollutants in the environment and design and analysis of engineered systems for the prevention and clean-up of pollution. Legal, political, and ethical aspects of environmental engineering are explored. The laboratory segment includes experimental design, performance of basic laboratory experiments, and field trips to water and wastewater treatment facilities.
Credit Hours: 4.00
Format: Class/Laboratory
Prerequisites: 5106
Projected Offering: Fall

1313 STEEL DESIGN

Determination of building loads including dead, live, snow, and wind in accordance with ASCE Standard 7. Structural behavior and design of steel members including beams, columns, beam-columns, and tension members. Design of bolted and welded connections. All design is based on the provisions of the AISC Specification for Structural Steel Buildings.
Credit Hours: 3.00
Format: Class
Prerequisites: 1317
Projected Offering: Spring

1317 STRUCTURAL ANALYSIS I

Analysis of statically determinate plane structures including internal forces and moments of members. Deflection analysis using the conjugate beam and virtual work methods. Analysis of moving loads using influence lines. Statically indeterminate structural analysis using consistent deformations and slope deflection. Computer applications included.

Credit Hours: 3.00
Format: Class
Prerequisites: 1206
Projected Offering: Fall

1320 INTRODUCTION TO ELECTRICAL AND COMPUTER ENGINEERING

Prepares non-engineers to function in a technological environment. Topics include basic electrical engineering and information technology: digital information, audio and image reproduction, communication systems, electronic navigation, computer systems and the Internet. The class will also discuss the role of technology in today's society, with an emphasis on the use by the Coast Guard and Homeland Security and the ethical issues raised by the misuse of technology. Laboratory work will focus on applications of the topics discussed in class. A group research project on current technology topics is required.

Credit Hours: 3.30
Format: Class/Laboratory
Prerequisites: 5266
Projected Offering: Fall and Spring

1321 ELECTRIC CIRCUITS AND MACHINES

An introduction to electric circuit analysis using Ohm's and Kirchoff's laws, Thevenin and Norton equivalents, nodal analysis of DC and AC circuits, solution of first order circuits, and the use of phasors in the solution of AC and three phase circuits. The principles and applications of electromechanical energy conversion and power systems, including transformers, DC and AC machines, induction motors, and synchronous generators.

Credit Hours: 4.00
Format: Class/Laboratory
Prerequisites: 3117
Projected Offering: Fall

1322 LINEAR CIRCUITS

The design of filters in both continuous and discrete time is examined. Particular emphasis is placed on the relationship between the poles and zeros of transfer functions and the resulting frequency responses of networks. Extensive computer use for the design and analysis of filters. State of the art laboratory instruments are used to measure the frequency responses of the filters designed and constructed. Final project emphasizes the design and use of digital filters.

Credit Hours: 4.00
Format: Class/Laboratory
Prerequisites: 1222
Projected Offering: Fall

1324 DIGITAL CIRCUITS AND COMPUTER SYSTEMS

Principles of digital systems design. Topics include number systems, Boolean algebra, Karnaugh maps, decoders, multiplexers, flip-flops, registers, counters, programmable logic devices, analysis and design of combinational and sequential circuits. Computers are used extensively in lab to control and monitor digital circuits designed and constructed by students. Labs focus on computer I/O, MultiSIM modeling, MATLAB programming, and graphical user interfaces. Top-down design is introduced, culminating in an intensive design project including a computer interface

Credit Hours: 4.00
Format: Class/Laboratory/Project
Prerequisites: 1218 or 1321 or (1320 and Major Coordinator's permission)
Projected Offering: Spring

1326 ELECTROMECHANICAL SYSTEMS
Principles and applications of electromechanical energy systems. Topics include 3-phase power, induction motors, synchronous machines, DC machines, electrical power distribution, and transformers. Laboratory experiments include transformers, building AC motors and testing rotating machinery.
Credit Hours: 3.30
Format: Class/Laboratory
Prerequisites: 1218
Projected Offering: Spring

1327 ACOUSTICS AND MUSIC
Examines the physics and engineering aspects of music reproduction from electric signals to acoustic waves. Requires at least one research paper with presentation to the class, and a semester project, the construction (from scratch) and testing of a set of audio speakers. Topics to be discussed include electromagnetic and electromechanical characteristics of speaker drivers; design parameters of various types of speaker enclosures; physics of hearing and sound; electronic filters and cross-over networks; instrumentation and measurements of acoustics and sound; standards and definitions; and mechanical engineering aspects of sound reproduction.
Credit Hours: 3.00
Format: Class/Project/Seminar
Prerequisites: 1321 or 1218
Projected Offering: Spring

1340 FLUID MECHANICS
The study of forces produced by fluids and their effects on bodies. Fundamental fluid mechanics principles: fluid properties, fluid statics stability of floating and submerged bodies, fluid flow equations relating to the conservation of mass, momentum and energy, dimensional analysis, viscous effects related to pipe and open channel flow, lift, drag, resistance, and fluid power applications. The exploration of design for fluids systems.
Credit Hours: 3.00
Format: Class
Prerequisites: 1116 and 3211
Projected Offering: Fall

1342 PRINCIPLES OF NAVAL ARCHITECTURE
The first course in a three (3) semester design sequence in the Naval Architecture and Marine Engineering Major. The course covers the fundamental principles of Naval Architecture including ship nomenclature, geometry, hydrostatics, stability, subdivision, hydrodynamics, ship structures, resistance, propulsion, and ship motions. Introduction to, and use of, computational methods will follow computation by traditional numerical techniques. In the laboratory portion of the course, the student will develop the skills required for the preliminary design of a vessel. In addition, this course has been selected as that course for which the Second Class NAME students will participate in the Hewitt Writing Contest.
Credit Hours: 4.00
Format: Class/Laboratory
Prerequisites: 1340
Projected Offering: Spring

1346 EXPERIMENTAL METHODS IN FLUIDS AND THERMAL SCIENCES
Experimental data analysis using uncertainty theory, curve-fitting, and statistical criteria. Basics of computerized data acquisition, analog to digital conversion, operation amplifiers, and signal conditioning. Instrumentation for flow, temperature, pressure, force, torque, strain and vibration is presented. Test planning, data point spacing, and professional society standard test procedures. The role of computer data acquisition systems to collect, analyze and display data is stressed, and computer techniques are used where possible. Weekly labs are designed to exercise the concepts of experimental design learned in class, as well as analyze various mechanical, fluid and thermal systems. The course includes an experimental design project.
Credit Hours: 3.00
Format: Class/Laboratory
Prerequisites: 1211, 1321, 1340, and 1351
Projected Offering: Fall

1351 THERMODYNAMICS
Fundamental principles of classical equilibrium thermodynamics . Modeling of gas and fluid properties. Thermodynamic processes. Development and application of the first and second laws of thermodynamics to steady flow and non-flow processes. Applications of thermodynamics to power and refrigeration cycles and to the design of thermal processes.
Credit Hours: 3.00
Format: Class
Prerequisites: 3211, 5106, and 5262
Projected Offering: Fall

1353 THERMAL SYSTEMS DESIGN
Principles of thermodynamic power cycles, including variations from the simple cycles. Combustion fundamentals. Principles of steam turbine, gas turbine, and diesel engine prime movers and their operating characteristics. System modeling and optimization, air pollution emissions and control, and psychrometrics. Design project based on course fundamentals, completed as a Heat Transfer – Thermal Systems Design course activity.
Credit Hours: 3.00
Format: Class
Prerequisites: 1351
Projected Offering: Spring

1358 INTRODUCTION TO C++ PROGRAMMING
This course is an introduction to basic C++ syntax, built-in data types, and fundamental program control structures, including selection (if/then/else), iteration (for, while), and programmer-defined functions. The roles of algorithms and debugging in programming are emphasized. Consideration of both console and text file input/output emphasizes appropriate formatting of output and user-friendly input with error checking and recovery. Programming assignments emphasize careful implementation of relatively simple algorithms.
Credit Hours: 1.50
Format: Class/Laboratory
Restrictions: 3/c standing
Projected Offering: Fall

1362 SOFTWARE DESIGN I
This course reinforces procedural programming skills and introduces object-oriented programming. It emphasizes procedural and object-oriented software design. Other topics include data structures, abstract data types, software test design, and object principles of composition, interaction, inheritance, and polymorphism. Lab work emphasizes a planned approach to software testing and debugging. Students design and implement a number of practical programs, culminating in a major software design project that is performed in groups.
Credit Hours: 3.50
Format: Class/Laboratory
Prerequisites: 1224 or 1358 or Permission of Instructor
Projected Offering: Spring

1366 INTRODUCTION TO GUI PROGRAMMING
This course is an introduction to graphic user interface (GUI) implementation using the object-oriented programming (OOP) facilities provided by Borland C++ Builder. Cadets will learn to place standard GUI controls, such as command buttons, check boxes, text edit boxes, and the like, on program forms, and to write code that manages the operation of these controls, retrieves user input data from them, and displays program results. Assignments will be practical GUI programming projects.
Credit Hours: 1.00
Format: Class
Prerequisites: 1362
Projected Offering: Fall

1370 MECHANISMS
Fundamentals of mechanisms and machinery design through introduction of the synthesis and analysis of mechanisms and machines. Rigid-body kinematics, kinetics, and dynamics as applied to linkage analysis and design. Position, velocity, acceleration, and force analyses. Weekly labs are devoted to hands-on designs, use of synthesis/analysis software, and design-build-test workshops.
Credit Hours: 4.00
Format: Class/Laboratory
Prerequisites: 1211
Projected Offering: Spring

1395 PROJECTS IN ENGINEERING
Projects in Engineering under the direct supervision of a faculty member. The projects can be direct participation in laboratory projects, research, or individual projects requiring periodic instructor review. Specific projects can involve construction of hardware, computer software, experimental work, or a paper study. Final written report required. May be taken only as an overload.
Credit Hours: 1.00
Format: Project
Prerequisites: Approval of Advisor and Major Coordinator
Projected Offering: Fall and Spring

1401 CONSTRUCTION PROJECT MANAGEMENT
This course provides an introduction to the management practices of the construction industry, specifically focusing on how projects are planned and executed. Topics include facility planning, design and contracting methods, construction drawings, specifications, and scheduling, life-cycle cost estimating, facility risk analysis, engineering ethics. Contemporary issues of the industry will also be analyzed, including sustainable design.
Credit Hours: 3.00
Format: Class/Project
Prerequisites: Senior Status
Projected Offering: Fall

1402 CIVIL ENGINEERING DESIGN
Civil Engineering Capstone Design Course requiring students to plan, design, and manage a complex open-ended civil engineering project. In accomplishing this goal, students produce engineering design documents, construction drawings, cost estimates, construction schedules, and any other necessary project specific documents. In addition, students communicate the results of their project via a formal presentation to their client.
Credit Hours: 4.00
Format: Project
Prerequisites: 1401 or Approval of Major Advisor
Projected Offering: Spring

1407 ENVIRONMENTAL ENGINEERING II
A follow-on to Environmental Engineering I. Design and analysis of water distribution systems, sewer systems, and physical, chemical, and biological treatment processes for water and wastewater treatment.
Credit Hours: 3.00
Format: Class
Prerequisites: 1309
Projected Offering: Spring

1408 SURVEYING
A study of surveying techniques as applied to property and construction surveys. Differential leveling, traverses, and topographic mapping are studied. Methods for calculating areas and volumes are covered. Proper use of standard surveying equipment such as levels, theodolites, tapes, and total stations are examined. Laboratory project: conducting a topographic survey and preparing a map of an assigned traverse.
Credit Hours: 3.00
Format: Class/Laboratory
Prerequisites: 3/c Standing
Projected Offering: Fall

1411 REINFORCED CONCRETE DESIGN
Fundamentals of reinforced concrete behavior and design. Detailed coverage of behavior and design of singly and doubly reinforced beams, T-beams, slabs, beam columns and spread footings. Additional topics: reinforcement placing, bar cutoffs, and bonds. Design and detailing based on current ACI code. Course includes extensive Excel programming and the design, construction and testing of a full-scale reinforced concrete beam.
Credit Hours: 3.00
Format: Class
Prerequisites: 1317 or 1206 and permission of Instructor
Projected Offering: Fall

1414 STRUCTURAL DESIGN FOR EXTREME EVENTS
Consistent with homeland security concerns, course examines the analysis and design of structures for extreme events, including blast and earthquake loads. Background in fundamental concepts of structural dynamics theory necessary to predict structural response and performance under extreme events, including: dynamics of single and multiple degree-of-freedom systems for various load functions; approximation methods for dynamic analysis; dynamic material behavior; elasto-plastic structural response. Study of blast and earthquake load characteristics. Design philosophies for building security and strategies to enhance earthquake and blast-resistant performance. As a side topic, control of building floor vibrations under conventional loads is also addressed.
Credit Hours: 3.00
Format: Class
Prerequisites: 1313, 1411, and 3215, or permission of Instructor
Projected Offering: Spring

1417 STRUCTURAL ANALYSIS II
Analysis of statically indeterminate structures by the moment distribution method. Matrix methods for the analysis of plane trusses and frames, including element formulations, transformation matrices, assemblage of structural stiffness matrices, load and displacement vectors, and post-processing. Additional structural analysis/design topics based on instructor's expertise and interests.
Credit Hours: 3.00
Format: Class
Prerequisites: 1317
Projected Offering: Spring

1419 DIRECTED STUDIES IN CE
Individual projects in Civil Engineering involving reading, design, analysis, or applications.
Format: Directed Studies
Projected Offering: Fall and Spring

1420 ANTENNAS AND PROPAGATION

Fundamentals of electromagnetic theory are presented. Maxwell's equations are developed from physical phenomenon. Plane electromagnetic wave propagation in various media. Propagation of waves on transmission lines, including computer simulations on ideal and practical lines. Antenna fundamentals are described. Performance of simple antennas and arrays. Design of simple antenna arrays and broad band antennas is presented. Computer aided design of antenna arrays, structures, and shipboard antennas is presented. A final design project gives each student the opportunity to design, construct, and test a multi-element array.
Credit Hours: 4.00
Format: Class/Laboratory
Prerequisites: 1218, 3211, and 5622
Projected Offering: Fall

1422 COMMUNICATION SYSTEMS

An analysis and design of communication systems with an emphasis on digital systems. Baseband and passband transmission systems are investigated. Coherent and noncoherent modulation/demodulation schemes are presented. Error correction coding, line codes, correlation, and intersymbol interference are also reviewed. Modulation techniques include analog AM and FM as well as digital BPSK, FSK and MSK. Related laboratory exercises make extensive use of Digital Signal Analyzers, Digital Storage Oscilloscopes and computers to study properties of communication signals and system.
Credit Hours: 4.00
Format: Class/Laboratory
Prerequisites: 1222, 1322 and 3341
Projected Offering: Fall

1424 COMPUTER CONTROL SYSTEMS

Modern methods of automatic control theory and design with an emphasis on digital control systems are presented. Time response of linear systems, error analysis, and compensation methods are presented and analyzed. Stability by Jury, Root Locus and Bode are covered. The State Variable method is introduced. Computer simulations in MATLAB; and Simulink; are introduced and developed. Methods of system identification are presented and analyzed. A related laboratory uses spectrum analyzers, computers, and computer-based systems, to develop, implement, and test a Proportional-Integral-Derivative (PID) controller.
Credit Hours: 3.50
Format: Class/Laboratory
Prerequisites: 1222 and 1322
Projected Offering: Spring

1426 PROJECTS IN ELECTRICAL AND COMPUTER ENGINEERING I

This is the first of two capstone courses in Electrical and Computer Engineering offered during the senior year. The focus of this course will be filling a “toolbox” of skills and concepts for succeeding as a Coast Guard project engineer. Classroom discussions will cover the engineering design process including needs identification, system requirements, system design process and engineering ethics. Additional lectures will center on contemporary electrical and computer engineering topics. In the lab, cadets begin a two-semester major engineering design project. Working as an apprentice engineer alongside faculty members and contractors as part of a small Coast Guard project team, students are presented with real-world engineering problems that require formal resolution with no predetermined outcome. A typical project includes requirements definition, computer programming, computer algorithm design and system implementation, data gathering and analysis, and presentation of results in a paper and oral presentation. Field trips to Coast Guard labs are and project related trips to various locations are included.
Credit Hours: 4.00
Format: Class/Laboratory/Project
Prerequisites: 1/c EE major or ECE Section Chief approval
Projected Offering: Fall

1429 DIGITAL SIGNAL PROCESSING

The development of basic DSP concepts to support an exposure to DSP applications is examined. Sampling theory, quantization, digital filters, Z-domain analysis, and Discrete Fourier Transforms serve as a basis for applications such as: speech compression, recognition, modeling and synthesis; digital audio processing; and, digital image processing. An integrated approach of theory and hands-on learning is used. The labs consist of computer programming and simulation along with implementing DSP systems using DSP hardware. Analysis of results is aided by the use of laboratory test equipment and computer software.
Credit Hours: 3.00
Format: Class/Laboratory
Prerequisites: 1222 and 1322
Projected Offering: Spring

1431 ELECTRONIC NAVIGATION SYSTEMS

An engineering study of electronic navigation systems used throughout the Coast Guard. Navigation tools such as Loran-C, Radar, Sonar, radio beacons, Global Positioning Systems (GPS), Differential GPS (DGPS), Wide Area Augmentation (WAAS) corrected GPS, and aircraft navigation systems (ILS, VOR and DME) are studied. Comparative analysis of the systems in both the time and frequency domains is studied. Other possible topics: propagation predictions, skywave effects, coverage diagrams, and weather effects.
Credit Hours: 3.00
Format: Class
Prerequisites: 1218 or 1321 or permission of the Instructor
Projected Offering: Spring

1432 COMPUTER COMMUNICATIONS AND NETWORKING

This course is an introduction to computer communications and networks. The course starts with approaches to networks designs and key factors in network evolution. The OSI reference model is used as a basis for studying TCP/IP. Peer-to-peer, Local Area Network, and Medium Access Control protocols are all discussed. The course concludes with a study of security protocols. Laboratory work includes analysis of network communications at the hardware and logical levels. Interwoven throughout the course is preparation for, and participation in, the joint-services Cyber Defense Exercise (CDX).
Credit Hours: 4.00
Format: Class/Laboratory
Prerequisites: 3213 or 3341
Projected Offering: Spring

1435 INTRODUCTION TO AERODYNAMICS

This course provides the necessary tools to understand the dynamics of flow fields and their impact on solid (aerodynamic) bodies. The course uses the fundamental laws of conservation (mass, momentum and energy) to develop the necessary equations of motion for inviscid, incompressible flows. Lifting theory for flow over 2-D airfoils (symmetric and cambered) and finite wings is presented. References and comparisons are made to surface ship hydrodynamics. Software tools are introduced and implemented in solving more complex problems. Preliminary aspects of compressible flow are introduced.
Credit Hours: 3.00
Format: Class
Prerequisites: 1340 and 1351
Projected Offering: Spring

1436 PROJECTS ELECTRICAL AND COMPUTER ENGINEERING II

This is the second senior-year capstone course in Electrical and Computer Engineering and completes the cadet's electrical and computer engineering program of instruction. In this course the cadets will be introduced to the skills and concepts for succeeding as a Coast Guard project manager. Classroom discussions will cover system testing, system reliability, team management, budgeting and scheduling. Additional lectures will cover engineering ethics, engineering economics and contemporary electrical and computer engineering topics. During the Laboratory periods, cadets bring their two-semester major engineering project to a close, and present the results to Academy faculty and to professionals from Coast Guard Headquarters and various Coast Guard engineering commands. Field trips to Coast Guard labs and project-related trips to various locations are included.
Credit Hours: 4.00
Format: Class/Laboratory/Project
Prerequisites: 1426
Projected Offering: Spring

1439 DIRECTED STUDIES IN ELECTRICAL ENGINEERING

Individual or group study of topics involving design, analysis, or applications of electric and electronics devices, systems, or principles.
Credit Hours: 3.00
Format: Directed Studies
Prerequisites: 1218 and 1222 and ECE Section Chief approval
Projected Offering: Fall and Spring

1440 MACHINE DESIGN

Design of machine elements, including considerations such as material strength, manufacturing processes, safety, reliability, stress concentration, fatigue, corrosion, and tribology. Mechanical power transmission devices, including shafts, gears, belts, springs, fasteners, bearings and couplings. Introduction to mechanical component integration and design-build-test projects.
Credit Hours: 4.00
Format: Class/Laboratory
Prerequisites: 1206, 1370
Projected Offering: Fall

1442 PRINCIPLES OF SHIP DESIGN

This course involves extensive use of the design process; application of estimation and iteration procedures with emphasis on preliminary hull dimensions and weight estimates; preliminary subdivision and development of general arrangements; intact stability analysis; and a longitudinal strength analysis. A seakeeping analysis based on the ship's operating requirements is conducted to determine the Operability Indices for mission-related operations in various sea states. Computer Aided Design software is used to develop hull geometry and interior arrangements. State of the art analysis tools are implemented to analyze hydrostatic characteristics and make an intact stability assessment in various loading conditions. This course is the initial segment of the capstone design project with emphasis on preliminary hull geometry, and both interior and exterior arrangements. The project is completed in the Ship Design/System Integration course (1444).
Credit Hours: 4.00
Format: Class/Project
Prerequisites: 1342
Projected Offering: Fall

1444 SHIP DESIGN/SYSTEM INTEGRATION

The Capstone design course for the Naval Architecture and Marine Engineering Major includes: Geometrically scaled model hull construction and resistance testing; electrical plant and selected auxiliary system design and analysis; project planning; marine propulsion plant selection and integration; heating, ventilation and air conditioning system design and analysis; engineering economics; trade-off studies in design, construction and life cycle costing applied to preliminary ship design developed in Principles of Ship Design (1442). The emphasis is on integration of hull and machinery systems into complete vessel package.
Credit Hours: 4.00
Format: Class/Project
Prerequisites: 1442, 1455 and 1453
Projected Offering: Spring

1446 MECHANICAL ENGINEERING DESIGN

Integrated design of mechanical systems including consideration of system performance, safety, reliability, cost, project management, and socio-ecological impacts. Engineering economy in design. Engineering ethics case studies and engineering standards. Advanced topics in modeling and testing of system components, numerical simulation of system characteristics, and system design optimization. The utilization of CAD design system. Capstone design projects require the application of the design process, including idea generation, concept design, prototype design and detailed design.
Credit Hours: 4.00
Format: Class/Project
Prerequisites: 1440
Projected Offering: Spring

1453 SHIP PROPULSION DESIGN

An advanced marine engineering design course requiring the application of sound judgment and analysis to engineering decisions. Students complete an individual preliminary design of an optimum propulsion system that meets specific operating specifications. Significant emphasis is placed on technical/scientific/professional writing through 7-8 design reports. Topics covered include hull resistance, hull vibration, fixed and controllable-pitch propeller performance, waterjet performance, propeller/waterjet selection, engine selection, engine and propulsor matching, electric drive and integrated power systems, reduction gear selection and design, engine room layout, propeller shafting design and propeller shaft vibration.
Credit Hours: 3.00
Format: Class/Project
Prerequisites: 1351 and 1353
Projected Offering: Fall

1455 SHIP STRUCTURES

This course runs concurrently with the Principles of Ship Design course and the Ship Propulsion Design course and addresses the structural design of the senior project. The course includes still water and wave induced vessel loading. The analysis of primary, secondary and tertiary hull stresses and the applications of American Bureau of Shipping Rules to ship structural design are addressed. Longitudinal bending and shear are discussed as well as elastic plate bending and buckling. Fatigue is also introduced, as well as hull materials and basic construction methods. The course includes homework and project work that culminates in the design of a vessel midship section and structural weight estimate.
Credit Hours: 3.00
Format: Class/Project
Prerequisites: 1204 and 1206
Projected Offering: Fall

1458 SOFTWARE DESIGN II

This course continues the study of software design. Major topics include data structures (lists, stacks, queues, hash tables, trees, and graphs) and accompanying algorithms, and common methods for algorithm design (greedy, backtracking, and divide-and conquer). Focus is on using standard data structures and algorithms in the design of software to solve specific problems. Lab work emphasizes a planned approach to software design, testing and debugging. Students design and implement a number of practical programs, culminating in a major software design project that is performed in groups.
Credit Hours: 3.50
Format: Class/Laboratory
Prerequisites: 1362
Projected Offering: Fall

1459 HEAT TRANSFER

Application of Fourier's law of conduction to one and two dimensional steady and non-steady state heat flow problems. Radiation heat transfer with black and gray surfaces. Newton's Law of Cooling applied to problems of forced convection. Analysis of heat transfer systems and engineering design using mass and energy continuity concepts. Design applications. Design project based on course fundamentals, completed as a Heat Transfer – Thermal Systems Design course activity.
Credit Hours: 3.00
Format: Class
Prerequisites: 1351
Projected Offering: Spring

1460 MECHANICAL CONTROL OF DYNAMIC SYSTEMS

The introduction to modeling mechanical systems and obtaining time-domain and Laplace-transform solutions. An emphasis is placed on understanding the fundamentals of simple, damped, and forced oscillations, transient response, and mechanical resonance. The commonalty of modeling and analysis techniques is stressed, as well as the use of input-output differential equations. Fundamentals of automatic control systems, including block diagram, root locus, Bode diagrams, as well as proportional, proportional and derivative, and proportional-integral-derivative feedback control systems. Incorporation of computer solutions to analyze and control linear dynamic systems.
Credit Hours: 3.00
Format: Class
Prerequisites: 1211, 1321, and 3215
Projected Offering: Fall

1462 FINITE ELEMENT ANALYSIS

Introduction to the theory and application of linear Finite Element analysis for the solution of real-world engineering problems. Review of Linear Algebra concentrating on vector and matrices manipulation. Review of Mechanics of Materials covering stress, strain, constitutive relations, and failure criteria. Modeling of physical systems; establishment of stiffness matrices; possible solution techniques using principle of virtual work and weighted residuals; application of external and internal loads and boundary conditions; practical evaluation of results including error analysis and measures of accuracy.
Credit Hours: 3.00
Format: Class/Project
Prerequisites: 1204, 1211, and 3301
Projected Offering: Spring

1465 DETECTION OF RADIOACTIVE MATERIALS

The purpose of this course is to provide students with an understanding of radioactive decay processes, the interactions of radiation with matter, radiation detection methods, and common radioactive materials, particularly those of concern for homeland security.
Credit Hours: 3.00
Format: Lecture and Laboratory, Class/Project
Prerequisites: 5266 and 3213 or 3301
Projected Offering: Spring

1469 DIRECTED STUDIES IN NAVAL ARCHITECTURE AND/OR MARINE ENGINEERING

Individual Projects in Naval Architecture and/or Marine Engineering involving reading, design, analysis, or applications. End of project deliverable which is generally a publishable paper, or a presentation is required.
Credit Hours: 3.00
Format: Directed Studies
Prerequisites: Approval of Advisor and Major Coordinator
Projected Offering: Fall and Spring

1479 DIRECTED STUDIES/MECHANICAL ENGINEERING

Individual or group projects in Mechanical Engineering involving design analysis, or applications. Preparation of a project report or presentation is required.
Credit Hours: 3.00
Format: Directed Studies
Prerequisites: Approval of Advisor and Major Coordinator
Projected Offering: Fall and Spring

1480 DESIGN PROJECT MANAGEMENT

Principles and techniques for creative idea generation and problem solving. Design processes applicable to engineering projects. Techniques for project scheduling and management. Technical communication skills for oral presentations, proposals, written reports and video production. CAD applications. Preliminary planning for capstone projects.
Credit Hours: 3.00
Format: Class
Prerequisites: 1/c Engineering Majors with Instructor’s Permission
Projected Offering: Fall

1489 SELECTED TOPICS IN ELECTRICAL AND COMPUTER ENGINEERING

This course will explore topics in electrical engineering and computing that expand upon the basic curriculum at the Academy. Instructors will select topics from subjects such as developing software for distributed computing on a network, processor architecture and assembly language programming, operating systems, or numerical methods in computation. Course material will include instruction and practical projects related to the selected topic. Cadets may repeat this course for credit with a different topic.
Credit Hours: 1.00
Format: Class/Laboratory
Prerequisites: Varies according to the specific topic
Projected Offering: Fall and Spring

2101 INTRODUCTION TO COLLEGE COMMUNICATIONS

Introduction to persuasive and informative writing to selected audiences for given purposes. Shorter and longer essays develop students' ability to write thesis statements, select evidence, and document sources within a process that supports revision. Writing practice and analysis of readings develop skills to improve coherence, diction, syntax, and conventions (grammar, punctuation, and spelling). Course also emphasizes public speaking and requires formal and informal speeches. Cadets who achieve a satisfactory level of performance in coursework and assessments, as evaluated by English faculty, will take 2123, Introduction to Literature in the spring; all others will be required to take 2111, English Composition and Speech in the spring and 2123 as upperclass.
Credit Hours: 3.00
Format: Class
Projected Offering: Fall

2111 ENGLISH COMPOSITION AND SPEECH

Instruction in the principles of oral and written communication with emphasis on logical thinking, coherence, and clarity. Practice in writing expository and persuasive essays and research papers based on the gathering and use of evidence and proper documentation.
Credit Hours: 3.00
Format: Class
Projected Offering: Fall and Spring

2121 THE ART OF EFFECTIVE WRITING

Academic writing, focusing on argumentation and persuasion. Practice in oral presentation. Reading and discussion of arguments.
Credit Hours: 3.00
Format: Class
Prerequisites: Placement by English faculty
Projected Offering: Fall

2123 INTRODUCTION TO LITERATURE

A thematically-organized course for entering cadets, enabling them to develop principles and strategies of leadership through examination of great works of fiction, poetry, and drama.
Credit Hours: 3.00
Format: Class
Prerequisites: 2101 or 2111 or 2121
Projected Offering: Fall and Spring

2125 INTRODUCTION TO LITERATURE (HONORS)

Intensive study of major works of poetry, fiction, and drama.
Credit Hours: 3.00
Format: Seminar
Projected Offering: Spring

2141 HISTORY OF THE UNITED STATES
A survey of the major social, economic, political, and diplomatic developments of the United States from the colonial period to the present. Utilization of primary and secondary documents, substantial reading and writing, and discussion.
Credit Hours: 3.00
Format: Class
Projected Offering: Fall and Spring

2235 SPANISH I
Introduction to the basics of the Spanish language. Requires composition and oral classroom drill sessions. Includes introduction to Spanish and Hispanic cultures and civilizations. Only students with no previous Spanish should register for this course.
Credit Hours: 3.00
Format: Class
Projected Offering: Fall

2236 SPANISH I/II
A one semester review of Elementary Spanish. All major topics covered in Spanish I and Spanish II will be reviewed. The course is aimed at students with any of the following backgrounds: 1. 2+ years of high school Spanish; 2. Lived in/near latino community where Spanish language was often spoken; 3. Native/near-native speakers of another Romance Language (French, Italian, Portuguese, Catalán...). Students must take online placement test: http://webcape.byuhtrsc.org/?acct=uscga. Password is "bears1".
Credit Hours: 3.50
Format: Class/Laboratory
Projected Offering: Spring

2237 SPANISH II
A continuation of Spanish I. Requires compositions and oral classroom drill sessions. Includes introduction to Spanish and Hispanic cultures and civilizations.
Credit Hours: 3.00
Format: Class
Prerequisites: 2235
Projected Offering: Spring

2259 PRINCIPLES OF AMERICAN GOVERNMENT
Foundations, organization, and processes of American democracy and national government. Analyses of the Constitution, Congress, Presidency, judiciary, administrative agencies, political organization and behavior and their roles in the policy-making process.
Credit Hours: 3.00
Format: Seminar
Prerequisites: 2141
Projected Offering: Fall

2261 AMERICAN FOREIGN POLICY
A study of the diplomatic history and foreign policy of the United States from the American Revolution to the present. The themes include continuity and change, domestic context, the policy-making process, and major events and players. Substantial reading and research assignments.
Credit Hours: 3.00
Format: Seminar
Prerequisites: 2141
Projected Offering: Spring

2263 AMERICAN GOVERNMENT
Through open discussion of political issues and controversies, this course examines the framework of our democracy. We will explore the history, founding, development and structure of our system of government, and come to understand why we continue to "approach democracy." In doing so, students will be given the opportunity to examine the strengths and weaknesses of American national government. We will also explore such topics as political parties, voting, elections, interest groups, the media, civil liberties, civil rights, domestic policy and foreign policy. The course is divided into five parts. Part I presents the foundations of American government. Part II explores the institutions of American democracy. Part III focuses on the processes of American Government and democracy. Part IV provides a detailed analysis of various issues of civil rights and liberties. Finally, Part V addresses the policy-making processes and its consequences.
Credit Hours: 3.00
Format: Class
Projected Offering: Fall and Spring

2283 EVALUATION AND COUNSELING
This is an introduction to the techniques, theory, and problems in the area of performance appraisal and counseling specific to military officers. Discussion issues will include decision making, multiculturalism, the influence of attitudes and values on judgment, and task analysis.
Credit Hours: 3.00
Format: Seminar
Projected Offering: Spring

2315 DRAWING I
This studio art course teaches students how to represent accurately and efficiently three-dimensional forms in space on a two-dimensional surface. The class requires the student to distinguish between what the eye truly sees and what the mind thinks it sees. Students are taught to visualize form as shape, to observe relative scale and relationships, and to confirm these observations with measurements. Students will work with simple forms in the beginning of the semester, using only line, and will progress to basic principles of one- and two-point perspective and more complex uses of line. The course is offered at the Lyme Academy College of Fine Arts in Old Lyme, CT and taught by Lyme Academy faculty. Prior studio art experience is not necessary.
Credit Hours: 3.00
Format: Studio/Three-hour course meets once a week
Projected Offering: Spring

2323 HUMANITIES IN WORLD LITERATURE: LITERATURE AND THE OTHER ARTS
Like 2324 and 2325, this course's curriculum may vary from year to year. Relationships among works of literature and the other arts, including painting, sculpture, music, dance and film. Emphasis will be on the development of Modernism in twentieth century architecture, visual art, film and literature. Government majors who have taken 2324 or 2325 may take this course as an other elective.
Credit Hours: 3.00
Format: Seminar
Projected Offering: Spring

2324 HUMANITIES IN WORLD LITERATURE: LATIN AMERICA
Like the other HWL courses, 2323 and 2325, this course's curriculum may vary from year to year, though its primary emphasis is on literature from outside the traditional Western canon. This course will focus on Latin American, Caribbean, and Latino literature, especially works written by Cuban Americans, Mexican Americans, and Puerto Ricans. Government majors who have taken 2323 or 2325 may take this course as an other elective.
Credit Hours: 3.00
Format: Seminar
Projected Offering: Spring - Odd

2325 HUMANITIES IN WORLD LITERATURE: POLITICS AND HISTORY
Reading of literature linked to important themes of the Government major, especially to the material covered in Western Political Theory, Comparative Politics, and the capstone course in the major. Like the other HWL courses, 2323 and 2325, this course's curriculum may vary from year to year. The course's focus in 2002 was Utopias and Dystopias in literature and political theory; in 2004, Medieval Europe: Crusades and Chivalry. Government majors who have taken 2323 or 2324 may take this course as an other elective.
Credit Hours: 3.00
Format: Seminar
Projected Offering: Spring - Even

2331 COAST GUARD SPANISH
Introduction to Coast Guard, military, nautical and other pertinent vocabulary in Spanish. Includes a review of basic Spanish.
Credit Hours: 1.00
Prerequisites: 2236, 2237 or equivalent
Projected Offering: Spring

2333 SELECTED TOPICS IN LITERATURE
Seminars are presented on themes and topics drawn from the world's literature. Subject matter, which varies with the instructor, will be announced each semester that the course is offered.
Credit Hours: 3.00
Format: Seminar
Prerequisites: 2101, 2111 or 2121; and 2123 or 2125
Projected Offering: Spring

2335 SPANISH III
Includes grammar review; speaking and writing; selections from Spanish literature. Students not coming into this course from Spanish II or Spanish I/II at the Coast Guard Academy must take placement test at: http://webcape.byuhtrsc.org/?acct=uscga. Password is “bears1”.
Credit Hours: 3.00
Format: Class
Prerequisites: 2237
Projected Offering: Fall

2337 SPANISH IV
Continuation of Spanish III.
Credit Hours: 3.00
Format: Class
Prerequisites: 2335
Projected Offering: Spring

2338 LATIN AMERICAN HISTORY
A survey of factors affecting Latin American history and political systems. Includes pre-Colombian, colonial, independence and modern influences. Similarities and contrasts within the region are examined. Course leads to understanding of both intra- and extra-regional patterns and relationships, including with the United States, Europe, international communism, and the third world.
Credit Hours: 3.00
Format: Seminar
Prerequisites: 2141
Projected Offering: Fall - Even

2341 EUROPE SINCE 1648
A study of the major political, social, economic, intellectual and international developments in Europe from the Early Modern Period through the end of World War II. Course requirements include papers, presentations, and substantial reading of primary sources.
Credit Hours: 3.00
Format: Seminar/Class
Prerequisites: 2141
Projected Offering: Spring - Odd

2345 WORLD WAR II
Evaluation of the causes, course and consequences of World War II. Topics include the interrelationship of social, economic, political and military factors in causing, waging, and ending war. Focus is at the strategic and operational levels, with special attention given to leaders, decision-making, and historical controversies.
Credit Hours: 3.00
Format: Seminar/Class
Prerequisites: 2141
Projected Offering: Fall - Odd

2349 ADVANCED SPANISH: INTERNATIONAL RELATIONS
This course focuses on Political Science and International Relations. The course is not intended to be an indepth dealing with these major areas of investigation, but rather as an overview of them and their subject matter with the explicit intent of familiarizing students with the lexicon and formal writing structures of these disciplines in Spanish. The primary course texts will be Woodford and Schmitt's Ciencia Politica y Relaciones Internacionales, Dozier's Manual de Gramatica and various online newspapers.
Credit Hours: 3.00
Format: Seminar
Projected Offering: Fall 2006, 2009

2351 GREAT EUROPEAN LEADERS
Examination of the lives of the greatest European leaders of the 20th century. Their leadership style, personality, ideology, ascent to power and historical impact will be examined through biographical and autobiographical studies, primary source documents and memoirs. The course will also analyze and compare characteristics and leadership styles and assesses the significance of their achievements and failures.
Credit Hours: 3.00
Format: Class/Project/Seminar
Prerequisites: 2341 or Instructor approval
Projected Offering: Fall

2357 RUSSIA
Analyzes the dynamics of post-Communist Russian politics against the historical backdrop of Communism and Tsarism. Cadets will also assess the impact of U.S. policies. Issues addressed will include nationalism, economic reform, and control of nuclear weapons.
Credit Hours: 3.00
Format: Seminar
Projected Offering: Spring

2360 SELECTED TOPICS IN PHILOSOPHY
Seminar on topics drawn from historical and contemporary philosophical thought. Topics will vary each semester, and will be determined by a survey of student interests. Topics may include Eastern philosophy, American philosophy, 20th century philosophy, existentialism, philosophy of religion, philosophy in literature and drama, theory of knowledge, metaphysics, or any philosophical field other than ethics and political philosophy.
Credit Hours: 3.00
Format: Seminar
Projected Offering: Spring

2361 WESTERN POLITICAL THEORY
Historical development of political theory in the West. Analysis of origins of classical political theory (Plato, Aristotle, Augustine, Aquinas, Luther, Calvin) leading to the study of post-medieval and modern writers (Machiavelli, Hobbes, Locke, Rousseau, Mill, Marx, and selected 20th century thinkers) and schools of thought.
Credit Hours: 3.00
Format: Seminar
Prerequisites: 2259 or 2263
Projected Offering: Spring

2365 COMPARATIVE POLITICS
Compares foreign political systems, ideologies and movements. Worldwide trends are explored and selected country studies undertaken.
Credit Hours: 3.00
Format: Seminar
Prerequisites: 2259 or 2263
Projected Offering: Spring

2367 INTERNATIONAL RELATIONS
A critical examination of the classical and contemporary international relations theories. The conditions that enhance or diminish security in the international system are explored and the influence of individuals, states, and non-governmental, regional, and international organizations on each other and the overall global community are compared and discussed.
Credit Hours: 3.00
Format: Seminar
Prerequisites: 2365
Projected Offering: Fall

2370 CONTEMPORARY UNITED STATES FOREIGN POLICY
Explores U.S. foreign policy from the late Cold War period to the present. Using historical events as our guide, we examine the foreign policy decision-making process and its major actors, including the President, Congress, bureaucracy and the news media. The course's main objective is for students to understand the complex nature of contemporary foreign policy, the special challenges confronted by the president in the post-Cold War world, and the future direction of U.S. foreign policy making. The course will begin by exploring the making of foreign policy and the special interpersonal relationships that influence the decision making process. We will closely scrutinize foreign policy during the Reagan administration, development during the Bush period and similarities and contrasts during the eight-year Clinton term. We will conclude the course by taking a regionally organized look at foreign policy challenges confronted by the current administration. Readings for the course will include both text chapters and journal articles.
Credit Hours: 3.00
Format: Seminar
Prerequisites: 2141
Projected Offering: Spring - Odd

2372 POLITICAL PARTICIPATION
Survey of the dominant modes of citizen participation in the American democratic system, including political parties, elections, interest groups, the media, social movements, and civil disobedience. Case studies include the media and the military; federal campaigns and elections; and violence in the American political tradition.
Credit Hours: 3.00
Format: Seminar/Project
Prerequisites: 2259 or 2263
Projected Offering: Fall - Even

2381 SOCIAL PSYCHOLOGY
Introduction to behaviors of the individual in society with a particular focus upon the enduring principles of human interactions. The concepts affiliation, attribution, values, authority, sexism, ethnicity, violence, and aggression will be explored. The individual as a member of an organization will also be discussed.
Credit Hours: 3.00
Format: Seminar
Projected Offering: Fall

2389 LAW AND THE COURTS
Seminar examining the roles of law and the courts in the United States. The structure of the judiciary, judicial processes and reasoning, as well as the nature and role of law in civil society are explored to provide a foundation for critically assessing judicial policymaking and its impact.
Credit Hours: 3.00
Format: Seminar
Prerequisites: 2259 or 2263, 2391 and 2457 or Instructor approval
Projected Offering: Spring - Odd

2391 CRIMINAL JUSTICE
An introductory course in criminal procedure and substantive criminal law concepts that impact military leaders and federal law enforcement officers. It includes a discussion of (1) fundamental concepts and issues relating to crime and punishment in modern society, (2) Constitutional concepts that influence criminal justice processes, (3) critical procedural differences between the civilian and military criminal justice systems, and (4) substantive crimes and defenses under the Uniform Code of Military Justice, and the disciplinary tools available to military commanders.
Credit Hours: 3.00
Format: Class
Projected Offering: Fall and Spring

2393 MORALS AND ETHICS
Examination of a range of philosophical views on what makes our actions right or wrong and our characters good or bad. Students are encouraged to develop their own moral voice, decision-making abilities, and a respect for the place of reasoned argument in the treatment of ethical problems.
Credit Hours: 3.00
Format: Class
Projected Offering: Fall and Spring

2395 RHETORIC AND COURTROOM ADVOCACY
A year-long (Fall and Spring Semester) course to promote your public speaking and advocacy skills, which will be honed while preparing for and representing one party in mock trials. At the conclusion of this course, the student will: (1) be a more refined speaker; (2) be skilled at persuasively advocating a particular viewpoint before a decision-maker; (3) be familiar with the fundamentals of litigation in a courtroom setting; and (4) be more comfortable speaking in front of a group of people. Extensive out of class preparation is required, as is mandatory attendance at the off-site mock-trial competitions (usually two/semester).
Credit Hours: 1.00 per semester
Format: Seminar
Projected Offering: Academic Year

2421 DIRECTED STUDIES IN HUMANITIES
Advanced tutorial concentrating on a specific topic in literature, philosophy, the arts or foreign languages. Intensive reading and consultation with a faculty member culminating in a major research paper. Limited to advanced students with previous significant course work in the humanities.
Credit Hours: 3.00
Format: Directed Studies
Prerequisites: Instructor and Department Head approval
Projected Offering: Fall and Spring

2425 SENIOR HONORS SEMINAR
Offered as an opportunity for 1/c cadets to engage in interdisciplinary discussions. The purpose is to assess the meaning and values of Academy education by practice in critical thinking and writing.
Credit Hours: 3.00
Prerequisites: Instructor approval
Projected Offering: Fall and Spring

2429 THE CRAFT OF CREATIVE WRITING
This course provides students with the opportunity to learn the craft of writing creative works, and provides them with an understanding of critical elements necessary for the creation of effective short stories, poems, and short plays. Students will share their writing in a group setting in order to improve skills through constructive criticism and supportive comment. Grading criteria will mostly be based on students' ability to use literary tools (e.g., metaphor, setting, irony . . .) in their own creative works.
Credit Hours: 3.00
Format: Class/Group Work/Project
Prerequisites: Instructor approval
Projected Offering: Spring - Even

2439 ADVANCED SPANISH
Rotating topics. This is an advanced conversation course. Students will be responsible for in-depth reading and analyses of literary, cultural, artistic or cinematic works. Grading based on in-class participation, papers and tests.
Credit Hours: 3.00
Format: Class/Seminar
Prerequisites: 2337 or equivalent
Projected Offering: Fall

2441 THE CIVIL WAR
Evaluation of the causes, course and consequences of the American Civil War. Themes include the development of America in the 19th century, the impact of slavery, expansion, and social change, and interrelationship of social, economic, political, military, and diplomatic factors in the war.
Credit Hours: 3.00
Format: Class/Project/Seminar
Prerequisites: 2141
Projected Offering: Fall - Even

2449 DIRECTED STUDIES IN PHILOSOPHY
Advanced tutorial concentrating on a specific research topic in philosophy. This is a program of intensive reading and consultation with a faculty member culminating in a major research paper. Limited to advanced students who have completed course work and shown significant interest in Philosophy.
Credit Hours: 3.00
Format: Directed Studies
Prerequisites: Instructor approval and Department Head approval
Projected Offering: Fall and Spring

2454 AMERICA IN THE NUCLEAR AGE
A study of the U.S. society and politics in the nuclear age, including scientific, cultural, strategic and political issues. Attempts at disarmament, literature focusing on nuclear weapons and nuclear holocausts, and key crises, such as the Cuban Missile Crisis, will be the focus of discussion periods during the semester. In addition to several scholarly works on the bomb and nuclear strategy and at least one novel, students will view several films that explore the consequences of nuclear weapons and nuclear war.
Credit Hours: 3.00
Format: Seminar
Prerequisites: 2141
Projected Offering: Spring - Even

2457 PUBLIC POLICYMAKING
A seminar evaluating the American policymaking process. Focusing on the interrelationship between policymaking institutions (the Presidency, Congress, courts, bureaucracy, and regulatory agencies) and individual and organizational participants (interest groups, political parties, stakeholders, media, and citizens), it identifies and evaluates the policy processes and politics that characterize American national government. Case studies focus on environmental, regulatory, immigration and economic policy areas.
Credit Hours: 3.00
Format: Seminar
Prerequisites: 2259 or 2263
Projected Offering: Fall

2459 DIRECTED STUDIES IN HISTORY
Advanced tutorial concentrating on a specific research topic in history. This is a program of intensive reading and consultation with a faculty member culminating in a major research paper. Limited to advanced students who have completed significant course work in History.
Credit Hours: 3.00
Format: Directed Studies
Prerequisites: Instructor approval and Department Head approval
Projected Offering: Fall and Spring

2461 CONGRESS AND THE PRESIDENCY
Examination of Congress and the Presidency as political and policy-making institutions. Focus upon the foundations, processes and politics of each institution and their interrelation in the making of public policy.
Credit Hours: 3.00
Format: Seminar
Prerequisites: 2259 or 2263
Projected Offering: Fall - Odd

2462 SELECT TOPICS IN PUBLIC POLICY
An in-depth look at a particular issue or field within public policy. Subject varies by instructor.
Credit Hours: 3.00
Format: Seminar
Projected Offering: Spring - Even

2463 UNITED STATES MARITIME HISTORY AND POLITICS
Analysis of U.S. Maritime, Naval, and Coast Guard history, and their interrelationship. The change in maritime transport throughout American history, the defense of national interests at sea, and the evolution of the Coast Guard and its roles and missions.
Credit Hours: 3.00
Format: Seminar
Prerequisites: 2141
Projected Offering: Fall

2465 UNITED STATES MILITARY POLICY
Analyzes the history of American military affairs from the colonial period to the present. Themes include the relationship between American culture and war-making, the growth of the U.S. Military as an institution and a profession, the links between national policy, foreign policy, military policy, and military strategy, and the civil-military relationship in America.
Credit Hours: 3.00
Format: Seminar/Class
Prerequisites: 2141 and 2259 (or 2263)
Projected Offering: Spring - Even

2467 GLOBAL POLICY STUDIES
Subject matter varies with the instructor. Course on Terrorism is offered under this course number.
Credit Hours: 3.00
Format: Seminar/Class
Prerequisites: 2141
Projected Offering: Fall

2469 NATIONAL SECURITY POLICY
Addresses the topic of U.S. national security policy from a historical, as well as contemporary perspective. The course starts with a historical treatment of the topic, beginning with the legislative birth of the National Security Council (NSC) in 1947, and then tracing its subsequent evolution over the past 58+ years. This part of the course examines the constitutional, political, and bureaucratic setting that shapes the formation of U.S. national security policy. Upon completing the historical examination of the evolution of the national security structure/organization/policy, the major focus of the remainder of the course is an examination of present-day threats/realities shaping U.S. national security policy. Class time and assignments during this section of the course involve surveying the current international environment, cataloging threats, analyzing current U.S. national security policy in place to address these threats, and then making recommendations to refine policy, or perhaps change course altogether.
Credit Hours: 3.00
Format: Seminar/Class
Prerequisites: 2141, 2259 or 2263, 2261, or Instructor approval
Projected Offering: Fall

2470 EXECUTIVE POLITICS AND POLICY [TYLER CHAIR SEMINAR]
More than a class on Presidential leadership, this course examines the roles of the President, the Cabinet departments, White House staff and Executive Office agencies in making foreign and domestic policy. Further, it examines the organization and management of the executive branch's policymaking processes as well as executive-congressional relations, and their dynamic impact on the policy-making process. The course will utilize the case–study method, examining numerous specific cases of executive branch policy-making, the politics of executive decision-making, and interagency processes. The continuing evolution of the Department of Homeland Security will serve as a "living laboratory," rich with timely/relevant examples that we will scrutinize throughout the course. As such, students will be expected to keep current with events/circumstances relating to the "new" cabinet department. During the Spring 2006 semester, this course will be co-taught by Adm. James M. Loy, USCG (Ret.), CGA's Distinguished Tyler Chair in Leadership. The seminar will be offered on Thursdays (3rd and 4th period), with a working lunch between these two periods. The seminar will frequently host host guest speakers that will address the course during the working academic lunch.
Credit Hours: 3.00
Format: Seminar
Prerequisites: 2259 or 2263
Projected Offering: Spring

2471 AREA STUDIES
The role of historic, social, economic, and cultural forces in framing the political system of a nation or a geographic area is examined. The area studied is based upon teaching resources in the department.
Credit Hours: 3.00
Format: Seminar
Prerequisites: 2141
Projected Offering: Spring

2472 DRUGS POLICY
A multidisciplinary survey of the historical, economic, cultural, political and organizational forces that have determined the character of the contemporary domestic and global challenge of illicit drugs and the U.S. policy response. Case studies will be used to examine why the worldwide production, trafficking, and consumption of drugs is flourishing despite a nearly century-old national and international prohibitionary regime designed to eliminate these activities. Students will be asked to assess the implications of what they learn for the future of the Coast Guard's drug enforcement mission.
Credit Hours: 3.00
Format: Seminar
Prerequisites: 2141, 2259 or 2263
Projected Offering: Spring - Odd

2474 POLITICS OF THE INTERNATIONAL ECONOMY
This course seeks to make sense of the revolutionary forces underway in the world economy and to explore what these changes mean for the future of international politics. By examining such issues as national attempts to control transnational corporations, organized crime migrants, child labor, telecommunications, the Internet, and mass media, students will be challenged to critically explore the relationship between forces at work in the global marketplace and the changing role of sovereign states, sub-state groups and individuals within the international system.
Credit Hours: 3.00
Format: Seminar
Prerequisites: 8215
Projected Offering: Spring - Even

2475 MEDIA AND AMERICAN POLITICS
Media and Politics examines the dynamic and complex relationship between the news media, government (i.e. institutions, elected leaders, agencies, etc.) and the U.S. political system (i.e. parties, interest groups, the electoral system etc.) “The fourth branch of government, “a political institution,” “an integral part of the American political system,” a “tool for governing.” Each of these terms has been used to describe the power of the U.S. news media, and yet the subject receives only cursory attention in many government classes and texts. This course will give you the opportunity to delve deeper in examining the relationship between the media and politics, fostering a greater appreciation of the media’s role and influence in our political system.
Credit Hours: 3.00
Prerequisites: 2457
Projected Offering: Spring

2476 DEMOCRACY IN AMERICA
Government Major Capstone. Interdisciplinary seminar examining the evolution of American political culture and the relationship between citizenship and civil society. Especially explored are the evolution of American identity, citizenship rights, privileges and obligations; and the relationships between nation-building, citizenship and political culture in modern democracies. Major case study explores the obligation to defend the nation, the evolution of the professional military, and the special obligations within civil society that the professional military officer bears.
Credit Hours: 3.00
Format: Seminar
Prerequisites: 2141, 2259 or 2263, 2361 or Instructor approval
Projected Offering: Spring

2479 DIRECTED STUDIES IN GOVERNMENT
Advanced tutorial concentrating on a specific research topic in government. A program of intensive reading and consultation with a faculty member culminating in a major research Paper. Limited to advanced students who have completed significant course work in Government.
Credit Hours: 3.00
Format: Directed Studies
Prerequisites: Instructor approval and Department Head approval
Projected Offering: Fall and Spring

2481 INTELLIGENCE AND NATIONAL SECURITY POLICY
An interdisciplinary survey and assessment of the role of the Intelligence Community (IC) in the process of developing and executing U.S. national and homeland security policies. Covered are the nature of intelligence and intelligence processes; the evolution, organization, and responsibilities of the Intelligence Community; relationships between intelligence agencies and key national and homeland security policy makers and overseers, such as the President, the National Security Council, Cabinet secretaries, and the Congress. Recent case studies illustrate the key processes, concepts, and debates regarding intelligence and its role in protecting American security. A special focus of the course is on Coast Guard Intelligence missions, organization, and functions in the post 9/11 security environment. This course is not open to students who have taken Intelligence and Democracy (2483).
Credit Hours: 3.00
Format: Seminar/Class
Prerequisites: 2259 or 2263
Projected Offering: Fall

2483 INTELLIGENCE AND DEMOCRACY
Exploration of the missions, organization, and processes of the U.S. Intelligence Community; the major debates about the roles, practices and problems of national intelligence; and the Coast Guard's multi-mission intelligence roles. The course includes an examination of the various functions of intelligence including collection systems (both human and technical), critical analysis, intelligence writing, espionage and counterintelligence, covert action, and the role of intelligence in counterterrorism, trans-national and asymmetric threat. Open to Government majors in the Public Policy track and Government majors in the International Affairs track who have taken 2469 as a free elective. This course is not open to students who have taken Intelligence and National Security Policy (2481).
Credit Hours: 3.00
Format: Seminar/Class
Prerequisites: 2259 or 2263, 2367, 2457, and 2469
Projected Offering: Spring

2489 DIRECTED STUDIES IN PSYCHOLOGY
Advanced tutorial concentrating on a specific topic in psychology. A program of intensive reading and consultation with sponsoring faculty member with program culminating in a major research paper.
Credit Hours: 3.00
Format: Directed Studies
Prerequisites: Instructor approval and Department Head approval
Projected Offering: Fall and Spring

2493 MARITIME LAW ENFORCEMENT
This course focuses on legal issues associated with the Coast Guard’s law enforcement mission. Topics include jurisdiction under international and domestic law, national and agency policy, self-incrimination, search and seizure, arrest, detention, use of force and self-defense, and agency and individual liability. In the process students will study maritime-related laws concerning illegal drugs, fisheries, immigration, and pollution.
Credit Hours: 3.00
Format: Class
Prerequisites: 2391
Projected Offering: Fall and Spring

2496 INTERNATIONAL LAW
The study of the principles of international law and the role(s) of international organizations. The emphasis will be on the function of international law in international relations, and the effectiveness of international law in regulating nation-state behavior, as well as its impact on military operations. The course will also take an in-depth look at sovereignty and the law of armed conflict.
Credit Hours: 3.00
Format: Seminar
Prerequisites: 2259, 2261, 2391
Projected Offering: Fall

2497 CONSTITUTIONAL LAW AND HOMELAND SECURITY
A study of the principal methods by which American government officials, including judges, legislators, and Presidents, give meaning to provisions of the U.S. Constitution. The primary focus is on homeland security and its impacts on civil liberties.
Credit Hours: 3.00
Format: Seminar
Prerequisites: 2361, 2391
Projected Offering: Spring

2498 SENIOR THESIS
Independent research project, under faculty supervision, resulting in written report and oral presentation.
Credit Hours: 3.00
Format: Directed Studies/Tutorial/Independent Research
Prerequisites: Approval of academic advisor, thesis advisor, and Department Head
Projected Offering: Fall and Spring

2499 DIRECTED STUDIES IN LAW
Advanced independent study concentrating on a specific legal topic. Requires extensive research, intensive reading and consultation with a faculty member. Culminates in a major paper comparable to a student-authored law review article. Limited to advanced students who have completed significant course work in law and government courses.
Credit Hours: 3.00
Format: Directed Studies/Project
Prerequisites: 2391, 2259, and one additional law course; Law Section and Department Head approval
Projected Offering: Fall and Spring

3107 INTRODUCTION TO CALCULUS
Begins a three-course sequence covering the material of the two-course sequence Calculus I (3111) and Calculus II (3117). Slower pace allows for more repetition of challenging concepts. The fundamental concepts of functions, limits, and differential calculus are presented. Techniques and applications of differentiation also are studied. Computer projects involving Mathematica, a computer algebra system for technical computation, are utilized.
Credit Hours: 4.00
Format: Class/Project
Projected Offering: Fall

3111 CALCULUS I
Presentation of the fundamental concepts of functions, limits, and differential calculus with an introduction to integral calculus. Techniques and applications of differentiation and calculating areas as limits are explored. Computer projects involving Mathematica, a computer algebra system for technical computation, are utilized.
Credit Hours: 4.00
Format: Class/Project
Projected Offering: Fall and Spring

3115 CALCULUS II (V)
Same topics as Calculus II (3117) treated in depth and at a pace consistent with the ability of the class. Computer projects involving Mathematica, a computer algebra system for technical computation, are utilized.
Credit Hours: 4.00
Format: Class/Project
Prerequisites: Department Head approval
Projected Offering: Fall

3117 CALCULUS II
Further extensive study of the fundamental concepts of differential and integral calculus. Topics include logarithmic, exponential, inverse trigonometric, and hyperbolic functions, integration techniques, applications of the definite integral, improper integrals, and infinite series. Computer projects involving Mathematica, a computer algebra system for technical computation, are utilized.
Credit Hours: 4.00
Format: Class/Project
Prerequisites: 3111
Projected Offering: Fall and Spring

3211 MULTIVARIABLE CALCULUS
The introduction to differential and integral calculus for functions of several variables. Topics include vectors, vector functions, surfaces in three-dimensional space, partial differentiation, multiple integration, and vector calculus.
Credit Hours: 3.00
Format: Class
Prerequisites: 3115 or 3117
Projected Offering: Fall and Spring

3213 PROBABILITY AND STATISTICS
An introductory course designed to explore the basic concepts and rules of probability, as well as the fundamentals of statistics. Computer methods are introduced to illustrate key concepts in probability. Utilizing a data analysis computer program, students learn to explore, describe and summarize real life data. Statistical methods are presented and applied to contexts including opinion polls, financial management and engineering applications. Emphasis is placed on the development of proper statistical reasoning and how it applies to the analysis of data, with particular attention paid to the validity of necessary assumptions. Projects requiring students to analyze actual data sets are an integral part of the course.
Credit Hours: 3.00
Format: Class/Project
Prerequisites: 3115 or 3117
Projected Offering: Fall and Spring

3215 DIFFERENTIAL EQUATIONS
Intermediate course in the methods of solving ordinary differential equations. Topics include first order equations, higher order linear equations with constant coefficients, Laplace transforms, systems of equations, power series solutions, numerical methods and applications.
Credit Hours: 3.00
Format: Class
Prerequisites: 3115 or 3117
Projected Offering: Fall and Spring

3221 LINEAR ALGEBRA
Study of mathematical systems with emphasis on vector spaces, linear transformations and matrices. Topics include systems of linear equations, vector spaces, linear mappings, determinants and eigenvalue problems. Computer methods are utilized.
Credit Hours: 3.00
Format: Class/Project
Prerequisites: 3115 or 3117
Projected Offering: Fall

3231 LINEAR OPTIMIZATION
Theory and application of deterministic models of operations research used in the optimization of linear functions of several variables subject to constraints. Topics include linear programming, simplex-based methods, sensitivity analysis, and integer programming. Computer projects are utilized.
Credit Hours: 3.00
Format: Class/Project
Prerequisites: 3115 or 3117
Projected Offering: Spring

3237 DISCRETE MATHEMATICS
Introduction to discrete methods and selected applications. Topics include fundamentals of logic, methods of proof, elementary number theory, set theory, mathematical induction, counting techniques, recursion, and O-notation.
Credit Hours: 3.00
Format: Class/Project
Prerequisites: 3115 or 3117
Projected Offering: Spring

3301 ADVANCED ENGINEERING MATHEMATICS
Special course offered for engineering majors and team taught with the Department of Engineering. Topics of interest are chosen from probability and statistics, linear algebra, numerical analysis, complex analysis and Fourier Series. Computer methods are utilized.
Credit Hours: 4.00
Format: Class
Prerequisites: 3215
Projected Offering: Spring

3311 ADVANCED CALCULUS
A rigorous approach to the topics of limits, continuity, differentiation, integration, optimization, and infinite series of a single variable.
Credit Hours: 3.00
Format: Class
Prerequisites: 3211 and permission of Instructor
Projected Offering: Spring

3333 NETWORK AND NONLINEAR OPTIMIZATION
An introduction to non-linear programming, dynamic programming, and network theory including CPM and PERT. Computer projects required.
Credit Hours: 3.00
Format: Class/Project
Prerequisites: 3211, 3231
Projected Offering: Fall

3335 VISUAL BASIC
Introduction to programming using Visual Basic. Topics include programming fundamentals, decision structures, loops, arrays, sorting and searching, graphics, and testing and debugging. Exercises with an emphasis on Coast Guard applications enable cadets to write programs that are robust, well structured, and exploit the capabilities of Visual Basic.
Credit Hours: 3.00
Format: Class/Project
Prerequisites: 3211
Projected Offering: Spring

3341 PROBABILITY THEORY
A rigorous development of probability theory necessary for advanced work in mathematics, statistics, operations research, and engineering. Topics covered include combinatorial methods, probability rules, discrete and continuous random variables, multi-dimensional distributions, moments and moment generating functions, special distributions, functions of random variables, and the central limit theorem. Computer projects are utilized.
Credit Hours: 3.00
Format: Class
Prerequisites: 3211
Projected Offering: Fall

3343 MATHEMATICAL STATISTICS
A mathematical development of statistical procedures such as point estimation methods and theory, confidence intervals, hypothesis test design, including the Neyman-Pearson Lemma and generalized likelihood ratio testing. Also covered are sampling distributions, contingency tables, and goodness of fit. Computer projects are utilized.
Credit Hours: 3.00
Format: Class
Prerequisites: 3341
Projected Offering: Spring

3351 PROBABILITY MODELS
An introduction to stochastic models used to describe dynamic systems. Topics covered include Markov Chains, Poisson Processes, birth and death equations, queuing systems, and forecasting. Applications are examined from many areas with an emphasis placed on Coast Guard related systems. Computer projects are utilized.
Credit Hours: 3.00
Format: Class/Project
Prerequisites: 3215, 3221, and 3341
Projected Offering: Spring

3417 NUMERICAL ANALYSIS
A mathematical development of modern numerical approximation techniques. Topics include solutions of non-linear equations, solutions of simultaneous equations, interpolation, differentiation and integration. Practical applications are emphasized. The advantages, disadvantages and limitations of techniques are investigated, paying particular attention to convergence and associated error. Projects require students to select and implement numerical techniques using available computer software.
Credit Hours: 3.00
Format: Class/Project
Prerequisites: 3215 and 3221
Projected Offering: Spring

3441 EXPLORATORY DATA ANALYSIS
This course provides an introduction to the process of data analysis including data preparation, statistical estimation and presentation of results. Methodology is illustrated with real data using appropriate software. Course content builds on the techniques discussed in Mathematical Statistics and introduces selected methodologies from the areas of non-parametric statistics, exploratory data analysis, robust statistics, and categorical data analysis.
Credit Hours: 3.00
Format: Class/Project
Prerequisites: 3343
Projected Offering: Fall

3447 LINEAR REGRESSION
The fundamental development of simple and multiple linear regression models is discussed with emphasis on estimation and inference techniques. Computer projects are utilized.
Credit Hours: 3.00
Format: Class/Project
Prerequisites: 3221, 3343 or 3213
Projected Offering: Fall

3453 DECISION MODELS
Using many of the fundamentals introduced in probability, applications in the areas of decision analysis, risk analysis, and other topics are investigated. Computer projects are utilized.
Credit Hours: 3.00
Format: Class/Project
Prerequisites: 3221, 3341
Projected Offering: Fall

3463 SIMULATION WITH RISK ANALYSIS
Introduction to computer simulation and modeling of real-world systems. Design, implementation, and validation of computer models of discrete and continuous systems are considered. Topics include principles of computer simulation methodologies, data collection and analysis, selecting distributions, and analysis of results. Individual and group projects are an integral part of this course.
Credit Hours: 3.00
Format: Class/Project
Prerequisites: 3343
Projected Offering: Spring

3471 OPERATIONS ANALYSIS
A capstone project oriented course applying mathematical, statistical, and operations research techniques to problems related to Coast Guard missions and other areas of interest. Required for all Operations Research majors during the Spring semester of first class year.
Credit Hours: 3.00
Format: Class/Project
Prerequisites: 3447
Projected Offering: Spring

3479 DIRECTED STUDIES IN OPERATIONS RESEARCH
A semester or more of individual work on a project approved by the Head, Department of Mathematics.
Credit Hours: 3.00
Format: Directed Studies
Projected Offering: Fall and Spring

4101 DEVELOPMENTAL SWIMMING
Developmental Swimming is designed to provide cadets who have been identified as weak swimmers with supplemental instruction in swimming.
Credit hours: 0.00
Format: Laboratory
Projected Offering: Fall

4102 PHYSIOLOGY OF FITNESS I
This course introduces cadets to the basic concepts and principles of lifelong fitness and wellness. Special attention will be given to the areas of cardio-respiratory fitness, muscular strength and endurance, and flexibility. Cadets will be expected to apply basic exercise physiology principles in the development and maintenance of personal fitness programs.
Credit Hours: 1.00
Format: Class/Laboratory/8-Week
Projected Offering: Fall

4103 PERSONAL DEFENSE I
Personal Defense I is an introductory level course designed to foster the development of personal defense skills. Upon completion of the course, cadets will be able to anticipate potentially unsafe situations and be able to better protect themselves. This course serves as the foundation for maritime law enforcement skills (Personal Defense II).
Credit Hours: 0.25
Format: Laboratory/8-Week
Projected Offering: Spring

4111 SWIMMING I
Swimming I is an introductory level course designed to develop fundamental skills in both survival and competitive strokes. By the end of the course, cadets should be competent swimmers and comfortable in the water.
Credit Hours: 0.25
Format: Laboratory/8-Week
Projected Offering: Fall

4112 PHYSIOLOGY OF FITNESS II
This course introduces cadets to the basic concepts and principles of lifelong fitness and wellness. Special attention will be given to the areas of nutrition, stress management, and the adoption of healthy lifestyle behaviors.
Credit Hours: 1.00
Format: Class/Laboratory/8-Week
Prerequisites: 4102
Projected Offering: Spring

4204 LIFETIME SPORTS I: RACQUETBALL
Racquetball is an introductory level course designed to foster the development of fundamental skills in racquetball and to support cadet commitment to lifelong participation in physical activity.
Credit Hours: 0.25
Format: Laboratory/8-Week
Projected Offering: Fall and Spring

4214 LIFETIME SPORTS II: GOLF
Golf is an introductory level course designed to foster the development of fundamental skills in golf and to support cadet commitment to lifelong participation in physical activity.
Credit Hours: 0.25
Format: Laboratory/8-Week
Projected Offering: Fall and Spring

4222 PROFESSIONAL RESCUER
The Professional Rescuer course is designed to provide each cadet with the knowledge and skills to effectively respond to emergency situations in both aquatic and land-based settings. Practical scenarios will be utilized to elicit problem solving and application of rescue principles. Successful completion of this course will lead to American Red Cross certifications in Lifeguarding, First Aid, CPR, Preventing Disease Transmission, AED, and Waterfront Lifeguarding.
Credit Hours: 2.00
Format: Class/Laboratory/16 weeks
Prerequisites: 4111
Projected Offering: Fall and Spring

4303 PERSONAL DEFENSE II: MARITIME LAW ENFORCEMENT TECHNIQUES
Personal Defense II exposes cadets to maritime law enforcement techniques. Upon completion of the course, cadets will be able to execute fundamental defensive techniques and prisoner control methods used by the U.S. Coast Guard .
Credit Hours: 0.25
Format: Laboratory/8-Week
Prerequisites: 4103
Projected Offering: Fall and Spring

4304 LIFETIME SPORTS III: TENNIS
Tennis is an introductory level course designed to foster the development of fundamental tennis skills and to support cadet commitment to lifelong participation in physical activity.
Credit Hours: 0.25
Format: Laboratory/8-Week
Projected Offering: Fall and Spring

4400 REMEDIAL PHYSICAL TRAINING
Remedial Physical Training is designed to provide cadets who score below their class standard on the PFE with supplemental information and training in physical fitness.
Credit Hours: 0.00
Format: Laboratory
Projected Offering: Fall and Spring

4401 WATER SAFETY INSTRUCTOR
The Water Safety Instructor course is designed to provide instructor candidates with the skills and knowledge needed to teach in the American Red Cross Swimming and Water Safety Program. Instructor candidates will learn how to use American Red Cross materials, how to conduct training sessions, and how to evaluate participant progress. Successful completion of all aspects of the course will lead to American Red Cross certification.
Credit Hours: 1.00
Format: Class/Laboratory/16 weeks
Prerequisites: 4111 and 4222
Projected Offering: Fall

4403 MARTIAL ARTS
This course provides instruction in strikes, punches and blocks common to martial arts styles. Sparring opportunities are provided in the second half of the course. Fee may be required.
Credit Hours: 0.50
Format: Laboratory/16 weeks
Prerequisites: 4103 and 4303
Projected Offering: Fall and Spring

4404 BADMINTON
This course provides instruction in the fundamentals of badminton. Cadets will receive instruction in technique, rules and tactical play for both singles and doubles
Credit hours: 0.25
Format: Laboratory/8 weeks
Projected offering: Fall and Spring

4405 ADVENTURE SPORTS I: ROCK CLIMBING
This course provides instruction in basic belaying, rappelling and climbing techniques. Climbing safety is a major focus. The course is conducted off campus. Fee required.
Credit Hours: 0.50
Format: Laboratory
Projected Offering: Fall and Spring

4407 DANCE
This course provides instruction in different forms of dance. Offerings include ballet, jazz, modern, tap and hip hop. This course is conducted off campus. Fee required.
Credit Hours: 0.50
Format: Laboratory
Projected Offering: Fall and Spring

4409 HORSEBACK RIDING
This course is designed to provide instruction in the fundamentals of horsemanship, including corral and trail riding, using western style saddles. Instruction geared to individual level of proficiency. Fee required. Classes are held at an off campus site.
Credit Hours: 0.50
Format: Laboratory/16 weeks
Projected Offering: Fall and Spring

4411 SCUBA DIVING
This course provides instruction in basic scuba diving safety and techniques and includes open water dive experience. N.A.U.I. certification is possible with successful completion of the course.
Credit Hours: 1.00
Format: Laboratory/16 weeks
Prerequisites: 4111 and 4222
Projected Offering: Fall and Spring

4414 ADVANCED GOLF
This course provides advanced instruction in golf and offers cadets the opportunity to play on local courses. This course is conducted at local golf courses. Fee required for golf course play.
Credit Hours: 0.25
Format: Laboratory/8 weeks
Prerequisites: 4214
Projected Offering: Fall and Spring

4415 ADVENTURE SPORTS II
This course provides instruction in outdoor recreational sports such as orienteering, mountain biking, hiking and boating (canoe/kayak). Some elements of this course are conducted off campus. Fees may be required.
Credit Hours: 0.50
Format: Laboratory/16 weeks
Projected Offering: Spring

4421 ADVANCED SCUBA DIVING
This course provides advanced instruction in scuba diving safety and techniques for those cadets who already possess a scuba certification. This course is conducted off campus. Fee required.
Credit hours: 0.50
Format: Laboratory/16 weeks
Prerequisites: Scuba certification
Projected Offering: Spring

4425 ROPES CHALLENGE
This course utilizes the Project Adventure Curriculum. Instruction will progress from initiatives, games, and problem solving to low and high elements.
Credit Hours: 0.50
Format: Laboratory/16 weeks
Projected Offering: Fall

4434 SKIING/SNOWBOARDING
This course provides instruction in alpine skiing or snowboarding. No experience is necessary. This class is held at local ski areas. Helmets required. Fee required for lift tickets and rentals.
Credit Hours: 0.25
Format: Laboratory/8 weeks
Projected Offering: Spring

4439 THEORY OF COACHING
This course provides instruction in the theory and techniques of coaching as well as opportunities for discussion on issues in contemporary athletics.
Credit Hours: 1.00
Format: Class/Laboratory/16 weeks
Projected Offering: Fall and Spring

4444 INDOOR RECREATIONAL SPORTS
This course will provide instruction in popular recreational activities such as badminton, pickle ball and bowling.
Credit Hours: 0.50
Format: Laboratory/16 weeks
Projected Offering: Fall and Spring

4459 SPORT/WELLNESS LEADER
This course provides an opportunity for cadets to acquire and utilize teaching and leadership skills in a physical activity setting. Cadets may choose to assist with instruction in a physical education class or provide guidance to cadets in the Remedial Physical Training program.
Credit Hours: 0.50
Format: Class/Laboratory/16 weeks
Projected Offering: Fall and Spring

4464 STRENGTH AND CONDITIONING

This course provides instruction in the various theories and principles of strength and conditioning and follows the guidelines of the National Strength and Conditioning Association.
Credit Hours: 0.50
Format: Class/Laboratory/16 weeks
Prerequisites: 4102 and 4112
Projected Offering: Spring

4499 DIRECTED STUDIES IN HEALTH AND PHYSICAL EDUCATION

This course provides an opportunity for cadets to study specific topics in the area of health and physical activity. Cadets will develop a proposal for a research paper or project, which must be completed by the end of the semester under the guidance of an HPE faculty member.
Credit Hours: 0.50
Format: Directed Studies
Projected Offering: Fall and Spring

5102 CHEMISTRY I

Chemistry I is the first half of a one-year curriculum in general chemistry. The course presents an introduction to elementary concepts of chemistry, covering topics of matter and measurement, atomic theory and inorganic nomenclature, mass relationships, reactions in aqueous solution, gas laws and reactions, enthalpy, quantum theory, periodic trends in the elements, chemical bonding, and intermolecular forces. Comprehensive laboratory program.
Credit Hours: 4.00
Format: Class/Laboratory
Projected Offering: Fall and Spring

5104 CHEMISTRY I (HONORS)

Scope essentially the same as 5102 with pace and depth varied to meet the capabilities and interests of students. Typically a single class section. There is a great deal of student/instructor interaction with strong emphasis on development of critical thinking skills. This is a course for those students with a strong background as well as an interest in science or engineering, and is ideal for Marine and Environmental Sciences and other technical majors.
Credit Hours: 4.00
Format: Class/Laboratory/Project
Prerequisites: Department Head approval
Projected Offering: Fall

5106 CHEMISTRY II

Chemistry II is the second half of a one-year curriculum in general chemistry. The course presents an introduction to elementary concepts of chemistry, covering the following topics: physical properties of solutions, chemical kinetics, chemical equilibrium, acid/base chemistry, acid/base equilibria, solubility equilibria, entropy/free energy/spontaneity, electrochemistry, nuclear chemistry, organic chemistry, and polymer chemistry. Comprehensive laboratory program.
Credit Hours: 4.00
Format: Class/Laboratory
Prerequisites: 5102 or 5104
Projected Offering: Spring

5108 CHEMISTRY II (HONORS)

The follow on course to Honors Chemistry I with similar themes and pace of instruction. Coverage of required General Chemistry topics usually concludes around Spring Break so that the remainder of the semester can be dedicated to special topics chosen by the instructor. Taught as a single class and lab section with a great deal of student/instructor interaction and a continued emphasis on critical thinking skills. Intended for students with a strong chemistry background, an interest in science or engineering, and particularly ideal for Marine and Environmental Sciences and other technical majors.
Credit Hours: 4.00
Format: Class/Laboratory
Prerequisites: 5102 or 5104 and Department Head approval
Projected Offering: Spring

5232 MARINE BIOLOGY
Consideration of the marine biosphere and its environmental subdivisions with emphasis on interaction in food chains and basic productivity. Review of plant and animal kingdoms in terms of the adaptations and ecological adjustments for marine habitats with detailed laboratory examination of specific forms.
Credit Hours: 4.00
Format: Class/Laboratory
Prerequisites: Instructor's approval for non-majors
Projected Offering: Fall

5234 MARINE GEOLOGY
Introduction to the concepts of physical geology with emphasis on the marine realm. Topics include minerals/rocks, plate tectonics, glaciers, polar regions, marine sediments, morphology/evolution of the coastal regions and ocean basins, hydrothermal vents and coral reefs. Labs/field trips focus on mineral/rock identification, map interpretation, and sediment sampling/analysis.
Credit Hours: 3.50
Format: Class/Laboratory
Projected Offering: Spring

5238 PHYSICAL OCEANOGRAPHY
Introduction to descriptive and dynamical physical oceanography. The distribution and variability of seawater properties. Characteristics of the world's major ocean currents and the forces affecting them. Underwater acoustics, waves, tides, and Coast Guard oceanography. Labs emphasize collection and analysis of oceanographic data.
Credit Hours: 3.50
Format: Class/Laboratory
Prerequisites: 5240
Projected Offering: Spring

5240 METEOROLOGY
Study of synoptic meteorology and climatology, with an introduction to atmospheric fluid dynamics. Atmospheric structure and radiative balances form the basis for understanding precipitation processes and stability. The effects of pressure and the earth's rotation on winds at local, synoptic, and planetary scales are considered, along with severe weather phenomena, local, and regional climatology. Mid-latitude storm development is emphasized, including upper-air influences and vorticity. Laboratory work emphasizes weather data collection, regional forecasting using local observations and National Weather Service products, and Coast Guard applications at sea.
Credit Hours: 4.00
Format: Class/Laboratory
Projected Offering: Fall

5247 PROJECTS IN MARINE SCIENCE
Involvement in ongoing research projects as an assistant in data collection, reduction, or analysis.
Credit Hours: 1.00
Format: Directed Studies
Prerequisites: Approval of Project Advisor and Marine Science Section Chief
Projected Offering: Fall and Spring

5262 PHYSICS I
Basic concepts of Newtonian mechanics, vector algebra, particle kinematics and dynamics, rotational kinematics and dynamics, conservation laws, oscillations, fluids, and wave motion.
Credit Hours: 4.00
Format: Combined Class and Laboratory
Corequisite: 3111
Projected Offering: Fall

5266 PHYSICS II
A study of basic concepts of electromagnetism is presented. Additionally, the study of electrostatics, magnetostatics, circuit theory, motions of particles in fields, electromagnetic waves, Faraday's law, Ampere's law is undertaken.
Credit Hours: 4.00
Format: Combined Class and Laboratory
Prerequisites: 3111 and 5262
Projected Offering: Spring

5306 PHYSICAL CHEMISTRY
Study of the states of matter and their properties, including ideal and real gases, kinetic theory, laws of thermodynamics, phase equilibria, chemical equilibrium, electrochemistry, chemical kinetics, atomic structure, the chemical bond, cohesion and structure, and molecular spectroscopy.
Credit Hours: 3.00
Format: Class/Laboratory
Prerequisites: 5106 or 5108 and 3211
Projected Offering: Fall

5312 ANALYTICAL METHODS
Theory and application of various techniques for the analysis of composition, structure, and properties of pure compounds and of mixtures. Emphasis on Coast Guard applications: gas and liquid chromatography, atomic absorption, ultraviolet, infrared, and nuclear magnetic resonance spectroscopy and mass spectrometry.
Credit Hours: 4.00
Format: Class/Laboratory
Prerequisites: 5106 or 5108
Projected Offering: Spring

5334 FISHERIES BIOLOGY
This course addresses Ichthyology and some aspects of Fisheries Techniques. Emphasis is placed on fish classification, fish internal and external anatomy, morphology, adaptive characteristics of fishes to their habitats, and human causes of aquatic biodiversity decline. Identification of important commercial and recreational species will be learned throughout the course and with the use of keys. Indoor, outdoor labs and a field trip are designed to provide hands-on familiarity with fishes and fisheries techniques. This course requires writing of a scientific paper based on the collection and analysis of students' data and a Hewitt paper and oral presentation.
Credit Hours: 4.00
Format: Class/Laboratory
Prerequisites: 5232 or Instructor's approval
Projected Offering: Fall

5338 MARINE FORECASTING
An advanced meteorology course with an emphasis on forecasting, especially at sea. After reviewing concepts from 5240 or 5442, students will learn advanced concepts, skills, and techniques in marine forecasting; and master them during weekly weather briefs. Regional studies will include the Gulf of Alaska; West, East, and Gulf Coasts of the Continental U.S.; and the Caribbean Sea. Advanced concepts will include wave development, hurricanes, nor'easters, and use of National Weather Service facsimile charts at sea.
Credit Hours: 3.00
Format: Class
Prerequisites: 5240, or 5442 and Instructor's approval
Projected Offering: As Required

5342 BIOLOGICAL AND CHEMICAL OCEANOGRAPHY
An ecological approach to life in the seas, with particular emphasis on energy flow through the food chain as shown by evaluations of the productivity of both producers and consumers. Discussion of the effects of natural vs. human-induced changes in marine ecosystems. Discussion of the data needed for mathematical modeling of specific ecosystems. Labs focus on up-to-date techniques for measuring seawater constituents relevant to the course; the last month of lab is devoted to a project/experiment designed and carried out by the student using techniques learned earlier in the semester.
Credit Hours: 4.00
Format: Class/Laboratory
Prerequisites: 5232 or Instructor's approval
Projected Offering: Spring

5350 OCEAN DYNAMICS
Course seeks to develop the students' understanding of how the ocean responds to the various forces which affect its motion. The basic concepts of fluid dynamics are first presented, with an emphasis on total acceleration and continuity of volume. The equation of motion for fluids on a rotating earth is derived and effects of turbulent motion are introduced. Both the steady-state and time-dependent solutions to the equation of motion are examined, including Ekman dynamics and inertial oscillations. The geostrophic approximation and its consequences/ applications are discussed in detail. Theory is related to the real world through discussion of oceanic observations documented in the literature. Labs provide students the opportunity to learn the basics of statistical data analysis techniques and computer modeling. Data analysis skills are then applied to hydrographic data acquired via the internet, and results and conclusions are presented via a scientific poster.
Credit Hours: 3.50
Format: Class/Laboratory
Prerequisites: 3211 and 5238
Projected Offering: Fall

5352 OCEAN CIRCULATION
Builds on the concepts of 5350, first deriving and then using the vorticity equation to examine the ocean. Time-dependent motion (i.e., waves) are examined, neglecting rotation for small-scale (surface gravity) waves and later adding it for larger scale wave phenomena including Kelvin, Poincare, and Rossby waves. Vorticity dynamics of the ocean are considered, focusing on wind-driven circulation theories, including the study of Sverdrup, Stommel, and Munk models. Theory is reinforced by the study of oceanic observations documented in the literature and in the lab program. Labs include the collection and analysis of oceanographic data and computer modeling, with field trips to the University of Rhode Island and the International Ice Patrol.
Credit Hours: 3.50
Format: Class/Laboratory
Prerequisites: 3215, 5240, and 5350
Projected Offering: Spring

5364 SEMICONDUCTOR PHYSICS
Study of properties of semiconductors. Crystalline structure, electron energy levels, impurity levels, electrical conduction, electron diffusion. Application to p-n junctions and semiconductor devices is presented.
Credit Hours: 3.50
Format: Class/Laboratory
Prerequisites: 3117 and 5266
Projected Offering: Spring

5366 ASTRONOMY
Historical and modern topics in astronomy are presented including the Solar System, stellar structure and evolution, galaxies, and cosmology. Includes night observations at the astronomical observatory and physical astronomical measurements.
Credit Hours: 3.00
Format: Class
Prerequisites: 5266, 5106
Projected Offering: Fall, Odd years

5389 DIRECTED STUDIES IN PHYSICS
Individual program of advanced readings or laboratory projects in physics.
Credit Hours: 3.00
Format: Directed Studies
Prerequisites: 5266 and Instructor's approval
Projected Offering: Fall and Spring

5402 ORGANIC CHEMISTRY
Chemical reactivity of organic compounds from a functional group perspective. Hydrocarbons, alkyl halides, aromatics, alcohols, ethers, carbonyl compounds, and amines. Laboratory introduction to important techniques of organic chemistry; the preparation of simple compounds; and analysis using mass spectrometry, nuclear magnetic resonance, infrared spectroscopy, and computer modeling.
Credit Hours: 4.00
Format: Class/Laboratory/Project
Prerequisites: 5106 or 5108
Projected Offering: Fall

5415 HAZARDOUS MATERIALS
A Marine and Environmental Sciences major capstone course that investigates the behavior of organic chemicals when they are released to the multimedia environment of air, water, soil, dissolved organic matter and biota. Quantitative multimedia distribution models based on fundamental chemical and physical properties are developed. Estimates of environmental effects are determined from the distribution models. A comprehensive final project requires that students behave as professional military scientists to solve a risk assessment problem.
Credit Hours: 3.00
Format: Class
Prerequisites: MES major or with consent of Instructor
Projected Offering: Spring

5417 TOXICOLOGY
Survey of the most important concepts in Toxicology. Effects of xenobiotic substances on the most important physiological systems will be covered with examples relevant to Homeland Security such as chemical warfare agents and industrial products. Exposure assessment, aerosol bio-dynamics, and dose response concepts will also be covered. Subject matter will include review of physiology as it pertains to effects of xenobiotics on the body.
Credit Hours: 3.00
Format: Lecture
Prerequisites: 5104 or 5108 or equivalent
Projected Offering: Spring

5421 PROJECTS IN CHEMISTRY
Involvement in ongoing research projects as an assistant in data collection, reduction, or analysis. Final project.
Credit Hours: 1.00
Format: Directed Studies
Prerequisites: Approval of Project Advisor and Chemistry Section Chief
Projected Offering: Fall and Spring

5429 RESEARCH IN CHEMISTRY
Individual or team reading and laboratory projects in chemistry.
Credit Hours: 3.00
Format: Directed Studies
Prerequisites: Approval of Research Advisor and Chemistry Section Chief
Projected Offering: Fall and Spring

5430 REMOTE SENSING
Initial consideration of the physics and technology of remote sensing theory. The principles of physical radiation, which form the foundation for remotely measuring surface processes, are first discussed in detail. Methods for measuring geophysical, biological, and chemical processes are then discussed in various degrees of detail. Lab exercises provide students with hands-on opportunities to display and analyze several global and decadal satellite datasets, and present their results and conclusions via a series of technical papers.
Credit Hours: 4.00
Format: Class/Laboratory
Prerequisites: 5238, and 5240
Projected Offering: As Required

5436 COASTAL OCEANOGRAPHY
The physical oceanography of the coastal zone is studied, as well as the dynamics of tidal flows in estuaries. Estuarine circulation and mixing at tidal and non-tidal time scales. The advection/diffusion relationships, and their application to the dispersal and monitoring of pollutants. Beach processes and interactions between estuaries and the coastal ocean. Labs emphasize student proposed and conducted research in the Thames River estuary. The results are presented at a symposium at the close of the semester.
Credit Hours: 4.00
Format: Class/Laboratory
Prerequisites: 3211 and 5238
Projected Offering: Fall

5441 MARINE POLLUTION
Examination of the sources, control, disposal, and impact of pollutants affecting the marine realm, such as sewage, industrial effluents, agricultural and urban runoff, oil, solid wastes, dredge materials, and acid rain. Issues presented via a mix of scientific, political and economic perspectives. Past, current, and proposed approaches to marine pollution problems are considered.
Credit Hours: 3.00
Format: Class
Prerequisites: 5232 or Instructor's approval
Projected Offering: Fall

5442 OCEANOGRAPHY
A survey of the physical, chemical, and biological aspects of the marine environment including meteorology, ocean circulation (currents, waves, and tides), coastal processes, marine ecosystems dynamics, fisheries technology and management, and marine pollution. Students strengthen their understanding of these topics through hands-on inquiry-based activities.
Credit Hours: 3.00
Format: Class
Prerequisites: 5102 and 5262
Projected Offering: Fall and Spring

5445 FISHERIES MANAGEMENT
This is a capstone course, which examines issues associated with the management and conservation of fisheries. The interaction between social, biological, economic, and political aspects of fisheries management is the focus of this course. The course is a combination of lectures, discussion, student presentations, and guest speakers. Guest speakers are invited from a variety of backgrounds including Coast Guard officers, National Marine Fisheries Service scientists, fisheries scientists, fisheries managers, and commercial fishermen, to expose students to various perspectives on fishing issues.
Credit Hours: 3.00
Format: Class
Projected Offering: Spring

5459 RESEARCH IN MARINE SCIENCE
Individual or team programs involving advanced reading in marine science research.
Credit Hours: 3.00
Format: Directed Studies
Prerequisites: Faculty Research Advisor and Marine Science Section Chief approval
Projected Offering: Fall and Spring

5475 INTRODUCTION TO GEOSPATIAL SCIENCES
This course introduces students to the fundamental concepts of geospatial sciences, including modeling the real world within a Geographic Information Systems (GIS), coordinate systems (including datum and projections), sources of spatial data, entering and editing the data within a GIS, GIS spatial data analysis techniques, and cartography. Relevancy of geospatial technologies to the Coast Guard will be demonstrated throughout the course through the use of several Case Studies. The lab portion of the course will emphasize hands-on applications of principles discussed in lecture. Students will be expected to apply GIS principles learned in lecture and lab portions of course in order to complete an end-of-semester GIS project.
Credit Hours: 4.00
Format: Class/Laboratory
Projected Offering: Spring

5477 OPTICS
An introductory course in optics designed to provide a working knowledge of electromagnetic theory. The fundamental principles of geometrical (e.g., reflection, refraction) and physical optics (interference, polarization, diffraction) are introduced. The emphasis of the course is on understanding the basic physical principles underlying practical photonic devices through the use of hands-on, in-class activities.
Credit Hours: 3.00
Format: Class
Prerequisites: 5266
Projected Offering: Fall – Even years

6112 NAUTICAL SCIENCE I – THEORY OF NAVIGATION
An introduction to navigation through an understanding of piloting and relative motion theory. In the piloting module, the emphasis is on chart interpretation, compass usage, computation of gyro error, and various coastal piloting techniques used to fix a ship's position such as dead reckoning, running fixes, and determination of set and drift. The relative motion module focuses on the radar system and its fundamentals, leading into basic relative motion problems involving a single contact. These relative motion problems are then taken a step further through computation of intercept and avoidance solutions. A research project covering selected navigational topics integrates course material and primary source research that the students then present to their classmates.
Credit Hours: 3.00
Format: Class/Laboratory
Projected Offering: Fall and Spring

6214 NAUTICAL SCIENCE II – VOYAGE PLANNING

This course builds upon and expands the basic navigation skills acquired in Nautical Science I to a point where the student is able to plan for both a coastal and transoceanic voyage. The course is divided into four modules and culminates in a group project. The first module develops the principal skills junior officers require to navigationally prepare a cutter for a deployment. This voyage planning process includes route selection, making use of various navigation publications, chart preparations, calculation of tides and currents, and anchorage selection. The second module involves celestial phenomena to determine such vital information as gyro error by azimuth and amplitude. During the third module, various navigation methods and systems are explored, such as differential GPS, hyperbolic navigation, and integrated electronic charting methods. It is during this module that the cadet is first formally exposed to the state-of-the-art visual ship simulator in which they will train for many hours in Nautical Science III and IV. The fourth module includes a review of basic relative motion fundamentals and expands into intermediate and advanced practices incorporating the first 19 Navigation Rules for collision avoidance. The group project involves a group of four to five students building and presenting a detailed navigation port brief to a commissioned officer selected from the faculty.

Credit Hours: 3.00
Format: Class/Laboratory
Prerequisites: 6112
Projected Offering: Fall and Spring

6316 NAUTICAL SCIENCE III – THEORY AND SCIENCE OF SHIPBUILDING

This course explores issues and techniques vital to successful performance as a Deck Watch Officer (DWO) or Engineer Officer in Training (EOIT) aboard a Coast Guard Cutter. In addition to reviewing basic navigation skills taught in Nautical Science I and II, students develop new skills such as basic shiphandling, rapid radar plotting (RRP), application of the Navigation Rules, and Team Coordination Training (TCT) techniques. Staff from the Engineering Department introduce concepts of basic naval architecture, including buoyancy, stability, weight additions and shifts, and free surface effects. Classroom shiphandling theory is reinforced aboard T-boats, while RRP, Navigation Rules applications, and TCT concepts are practiced in radar and visual simulators. TCT concepts are further analyzed in group projects wherein cadets present the causal factors and potential corrective actions surrounding selected Coast Guard Cutter mishaps. Nautical Science III also introduces cadets to effective communication through various forms of official Coast Guard correspondence.

Credit Hours: 4.00
Format: Class/Laboratory
Prerequisites: 6112 and 6214
Projected Offering: Fall and Spring

6418 NAUTICAL SCIENCE IV – THE COAST GUARD DIVISION OFFICER

This capstone course integrates prior nautical science topics with selected Coast Guard organizational and leadership issues. As Division Officers, new Ensigns are expected to accomplish the unit's mission while remaining responsive to their subordinates' needs and managing their own career. Cadets prepare for these responsibilities in Nautical Science IV by discussing Coast Guard personnel management issues in depth, and by developing administrative skills they will be expected to possess upon graduation. Lab assignments in the visual and radar simulators, and aboard 65 foot training vessels develop critical thinking and decision-making skills in navigation and shiphandling, and reinforce Team Coordination Training concepts through effective leadership and communication. The shipboard engineering module of the course reviews basic naval architecture concepts, environmental issues, and the Engineer Officer in Training (EOIT) program. The newly added Search and Rescue (SAR) module examines Coast Guard policy, planning and procedures within this critical mission area. A major oral and written assignment requires research into current Coast Guard policies and issues, and comprises the majority of work for the 1/C Cadet Hewitt Writing and Speaking Contest requirement.

Credit Hours: 4.00
Format: Class/Laboratory/Project
Prerequisites: 6112, 6214, and 6316
Projected Offering: Fall and Spring

8115 MACROECONOMIC PRINCIPLES

Examination of basic concepts, methodology and problems of macroeconomic measurement and aggregate economic activity. money, banking, international trade and finance. Macroeconomic policy for economic stability and growth.

Credit Hours: 3.00
Format: Class
Projected Offering: Fall and Spring

8211 LEADERSHIP AND ORGANIZATIONAL BEHAVIOR
Using leadership as its focus, this course examines the relationship of individual and group behavior in organizations to organizational effectiveness. Uses case studies, classroom exercises, lecture, and discussion to develop an understanding of motivation, group/team effectiveness, communications, and performance management with particular attention to the practical leadership implications of current theory.
Credit Hours: 3.00
Format: Class/Group Work/Project
Projected Offering: Fall and Spring

8215 MACROECONOMIC PRINCIPLES
Examination of basic concepts, methodology and problems of macroeconomic measurement and aggregate economic activity. money, banking, international trade and finance. Macroeconomic policy for economic stability and growth.
Credit Hours: 3.00
Format: Class
Projected Offering: Fall and Spring

8217 MICROECONOMIC PRINCIPLES
Basic analysis of individual economic decision making in a market economy. Consumer behavior and theory of demand; production cost, theory of supply and firm behavior in different market structures. Public policy to improve market performance. Resource markets.
Credit Hours: 3.00
Format: Class
Projected Offering: Fall

8231 MANAGEMENT INFORMATION SYSTEMS
Prepares managers to function in a technological environment. The roles of information processing in managerial decision making. The structure of information systems; development; management computing technology, data processing, and information assurance. Applications within major functional subsystems of management. The class will also discuss the role of technology in today's society, with an emphasis on the use by the Coast Guard and Homeland Security and the ethical issues raised by the misuse of technology. Laboratory work will focus on applications of the topics discussed in class. A group research project on current technology topics is required.
Credit Hours: 3.00
Format: Class/Project/Laboratory
Projected Offering: Spring

8246 FINANCIAL ACCOUNTING
Accounting process as a system for communicating financial information to internal and external users in both profit-based and non-profit setting. Fundamental financial accounting concepts related to the balance sheet, income statement, and statement of cash flows. Introduction to government and not-for-profit accounting and application of basic cost accounting concepts Focus on the decision-usefulness of accounting information from the perspective of the user. Extensive analytical problem-solving, both structured and unstructured.
Credit Hours: 3.00
Format: Class
Projected Offering: Spring

8323 INTERNATIONAL ECONOMICS
Analysis of the basic theories and policy issues in international economic relations. Theories of trade; economic growth and trade; tariffs, quotas, and other barriers of trade; custom unions and common markets. Currency systems, exchange rate adjustments, balance of payments, balance of payments adjustments, and U.S. commercial policy. Major paper required.
Credit Hours: 3.00
Format: Class/Seminar
Prerequisites: 8115 or 8215
Projected Offering: Spring - Odd

8329 GLOBAL ECONOMIC ISSUES
Seminar course offers in-depth study on current issues of interest in international economics.
Credit Hours: 3.00
Format: Class/Seminar
Prerequisites: 8115 or 8215
Projected Offering: Spring - Even

8337 DATABASE SYSTEMS
Examination of the fundamental concepts of database management. Database design, database languages and database-system implementation. Analysis of the role of databases in the decision making process and their use in strategic planning. A project to develop a database management system is required.
Credit Hours: 3.00
Format: Class/Project/Laboratory
Prerequisites: 8331
Projected Offering: Fall

8343 PUBLIC SECTOR ECONOMICS
Application of Economic logic to public sector issues; market failure and the economic rationale for government intervention; public choice and public goods; analysis of taxation and government expenditure policy; examination of selected taxes and expenditure classifications.
Credit Hours: 3.00
Format: Class
Prerequisites: 8115 or 8215, 8217
Projected Offering: Spring - Even

8348 MANAGERIAL ACCOUNTING
The examination of cost information in decision making for both the short and long terms. Topics include the different costing systems, cost behavior and estimation, standard costing and variance analysis, along with flexible budgets and control of overhead costs. Extensive analytical problem solving, including the use of cases.
Credit Hours: 3.00
Format: Class
Prerequisites: 8346
Projected Offering: Spring

8349 FINANCIAL MANAGEMENT
Application of financial theory, tools and methods to managerial decision-making with a goal of value maximization through effective cash flow management. Focus is on the investment decision (asset risk, time-value of money, cost of capital, discounted cash flow analysis) and the financing decision (financial risk, use of leverage, capital structure). Some coverage of financial markets. Extensive analytical problem solving, including the use of cases.
Credit Hours: 3.00
Prerequisites: 3213, 8246
Projected Offering: Fall

8351 QUANTITATIVE METHODS
Introduction to techniques of quantitative analysis. Applications of probability and statistical analysis. Applied decision theory, break-even analysis, marginal analysis and investment decision. Use of econometric methods, simple and multiple linear regression models, curve fitting, and time series analysis. Coverage of some classical optimization techniques and inventory management. Problem solving, computer applications, and case studies.
Credit Hours: 3.00
Format: Class
Prerequisites: 3213
Projected Offering: Fall

8353 INFORMATION SYSTEMS FOR MANAGERS
Further development of the principles of MIS introduced in 8231, especially as they relate to U.S. Coast Guard applications. Topics analyzed include Information Systems (IS) management in a historical perspective, IS at the management and functional levels, IS and the end user, the future of IS, and a review of IS applications in the U.S. Coast Guard. Extensive use of cases.
Credit Hours: 3.00
Format: Class/Project/Cases
Prerequisites: 8331
Projected Offering: Spring

8357 HUMAN RESOURCES MANAGEMENT
Personnel/Human Resources Management concepts. An in-depth analysis of the Human Resource functional areas including recruitment, selection, performance evaluation, promotion, retention, EEO guidelines, and Federal regulations. Term paper.
Credit Hours: 3.00
Format: Seminar/Cases/Project
Prerequisites: 8211
Projected Offering: Fall

8358 NEGOTIATIONS AND CONFLICT IN TEAMS
An in-depth analysis of concepts relating to conflict, negotiation, influence, and power, as applied to decision making in a team environment. Topics analyzed include integrated and distributed bargaining, bases of power, influence tactics and strategies, decision making, and threats to team effectiveness. Extensive use of exercises, cases, and student presentations.
Credit Hours: 3.00
Format: Class/Seminar
Prerequisites: 8211
Projected Offering: Fall - Even

8361 TRANSPORTATION ECONOMICS
Examination of analytical frameworks and policy issues in transportation economics. Topics analyzed include demand for transportation service, cost and pricing, economic efficiency, and mode-specific analytical and political issues including government regulation and deregulation. Case Studies.
Credit Hours: 3.00
Format: Class/Seminar
Prerequisites: 8115 or 8215, 8217
Corequisites: 8313
Projected Offering: Spring - Odd

8363 OPERATIONS RESEARCH
The study of applications of operations research techniques to managerial decision-making such as linear programming, transportation and assignment algorithms, network analysis, dynamic programming, and game theory. Exposure to industrial applications: maintenance and production scheduling, project planning and management. Emphasis on problem solving, computer applications and case studies.
Credit Hours: 3.00
Format: Class/Cases
Prerequisites: 3213, 8351
Projected Offering: Spring

8366 LEADERSHIP AND ORGANIZATIONAL DEVELOPMENT
Examination of leadership issues in an organizational framework. Topics include a historical review of organizational management thought; leadership theories with organizational applications; organizational diagnosis and analysis; organizational culture, change, and improvement; and concepts that relate to leading public organizations (such as organizational vision, parallel systems, and quality concepts).
Credit Hours: 3.00
Format: Class/Seminar
Prerequisites: 8211
Projected Offering: Fall and Spring

8367 ADVANCED LEADERSHIP
Examination of leadership issues in an organizational framework. Topics include a historical review of organizational management thought; leadership theories with organizational applications; organizational diagnosis and analysis; organizational culture, change, and improvement; and concepts that relate to leading public organizations (such as organizational vision, parallel systems, and quality concepts).
Credit Hours: 3.00
Format: Class
Prerequisites: 8211
Projected Offering: Fall

8413 MANAGERIAL ECONOMICS
Analysis of microeconomic forces in managerial decision making. Topics include: consumer demand and indifference curves; production functions and cost theories; producer behavior in different market structures; pricing theories: multiproduct pricing, pricing to deter entry; and transfer pricing; vertical integration. Evaluation of alternative firm objectives, and the non-traditional firm. Cost-benefit analysis.
Credit Hours: 3.00
Format: Class
Prerequisites: 8217
Projected Offering: Spring

8417 INVESTMENT THEORY
This course is an introduction to the modern investment theory. Major topics include utility theory, mean-variance portfolio construction, the Capital Asset Pricing model (CAPM), Arbitrage Pricing Theory (APT), efficient market hypotheses, interest rate theories, valuation of financial assets and their derivatives, as well as investment analysis and asset allocation to meet investment objectives.
Credit Hours: 3.00
Format: Class
Prerequisites: 3213, 8217, 8349 or equivalent courses
Projected Offering: Fall - Odd

8421 INTERNATIONAL FINANCIAL MANAGEMENT
This course addresses financial decision-making and operations in an international context. Principal topics are: international monetary system; forward/spot market relationships; international interest parity relationships, interest rate and currency derivatives; exchange rate risk management; international financial institutions; international equity markets and portfolio management; and capital budgeting and valuation in the environment of a multinational concern.
Credit Hours: 3.00
Format: Class
Prerequisites: 8349
Projected Offering: Fall - Even

8423 MANAGEMENT CONTROL
Study of the management control function in public, private, and governmental organizations: planning, programming, budgeting, operating and measurement, reporting and evaluation. Managerial accounting issues related to cost analysis and its role in decision-making and control.
Credit Hours: 3.00
Format: Seminar/Class
Prerequisites: 8115 or 8215, 8217
Corequisites: 8346
Projected Offering: Fall - Odd

8429 MANAGERIAL PSYCHOLOGY
The course is taught as a graduate style seminar where students will have responsibility to lead class discussions. It is a rigorous reading intensive study of advanced behavioral science topics such as MBTI, Transactional Analysis, Motivation, Commitment, Emotional Intelligence. A significant reading assignment and an entrance exam are required prior to the first day of class.
Credit Hours: 3.00
Format: Class/Seminar
Prerequisites: 8211
Corequisites: 8366
Projected Offering: Spring - Even

8439 DIRECTED STUDIES IN ECONOMICS
An in-depth, major research effort in an area of mutual interest to cadet and faculty member directing study. Directed Studies proposal must be submitted in writing and approved by the Department Head, applicable Section Head, and sponsoring faculty member.
Credit Hours: 3.00
Format: Directed Studies
Prerequisites: 8115 or 8215, 8217, 8313
Restrictions: 1/c Management majors and approval of Department Head
Projected Offering: Spring

8443 MARKETING
Marketing concepts and their relationship to strategic management of private, public, and not-for-profit organizations. Marketing mix, market segmentation, product differentiation, demographics, and advertising, promotion, distribution. Marketing of services and marketing's role in governmental organizations.
Credit Hours: 3.00
Format: Class/Cases
Prerequisites: 8217
Corequisites: 8217
Projected Offering: Fall

8445 PUBLIC MANAGEMENT CONSULTING
Management consulting project with Coast Guard units and/or governmental and not-for-profit organizations. Topics of emphasis vary with projects. Detailed project report and client presentation required.
Credit Hours: 3.00
Format: Project/Seminar
Prerequisites: 8357 and 8447
Restrictions: 1/c Management majors
Projected Offering: Spring

8447 STRATEGIC MANAGEMENT
Strategy and policy development in the private and public sectors. Emphasis on environmental analysis, strategic advantage profile, social responsibility, and ethics. The relationships of finance, personnel, marketing, and structure to policy decisions. Case studies/simulation.
Credit Hours: 3.00
Format: Class/Cases/Project
Prerequisites: 8115 or 8215, 8217, 8346, 8349, and 8366
Restrictions: 1/c Management majors only
Projected Offering: Fall

8455 INFORMATION TECHNOLOGY IN ORGANIZATIONS

In-depth examination of fundamental technological and managerial issues relevant to information technology management in the U.S. Coast Guard. Topics of emphasis include: computer architecture, network theory, and system administration, analytical processes in determining an organization's information technology needs, and the Coast Guard's IT plan. Structured to address state of the market and research developments in IT. A project with emphasis on real-world applicability is required.
Credit Hours: 3.00
Format: Class/Project/Laboratory
Prerequisites: 8331 or permission of the Instructor
Projected Offering: Fall

8459 SELECTED TOPICS IN LEADERSHIP

In depth examination of advanced leadership topics. Specific course content will vary based on emerging leadership theory, institutional and organizational needs, and student desires. Potential topic areas include intrinsic vs. extrinsic motivation, commitment vs. compliance, transformational leadership, visionary leadership, responsibility and accountability, strategic leadership, establishing and communicating a vision, communication and decision-making. Includes extensive reading, research, case writing, and a comprehensive writing assignment.
Credit Hours: 3.00
Format: Class
Prerequisites: 8366
Restrictions: 1/c cadets
Projected Offering: Fall and Spring

8468 DIRECTED STUDIES IN FINANCE

Provides the student an opportunity to work closely with a faculty member in an area of mutual interest. Potential topics include, but are not limited to, investment theory, risk management, option pricing, and advanced topics in corporate finance. Directed Studies proposal must be submitted in writing and approved by the Department Head, applicable Section Head, and sponsoring faculty member prior to the beginning of the semester.
Credit Hours: 3.00
Format: Directed Studies
Prerequisites:
Restrictions: 1/c Management majors and approval of Department Head
Projected Offering: Spring

8469 DIRECTED STUDIES IN MANAGEMENT

An in-depth, major research effort in an area of mutual interest to cadet and faculty member directing study. Directed Studies proposal must be submitted in writing and approved by the Department Head, applicable Section Head, and sponsoring faculty member prior to the beginning of the semester.
Credit Hours: 3.00
Format: Directed Studies
Prerequisites: 8349
Restrictions: 1/c Management majors and approval of Department Head
Projected Offering: Fall and Spring

8479 DIRECTED STUDIES IN INFORMATION SYSTEMS AND DECISION SCIENCES

Provides the student with an opportunity to work closely with a faculty member in an area of mutual interest. Potential topics include, but are not limited to, development of database applications, web applications, understanding and application of new technologies, and advanced topics in information systems and decision sciences. Project proposals must be approved prior to the beginning of the semester.
Credit Hours: 3.00
Format: Directed Studies
Prerequisites: 8331, 8351, 8363 or equivalent courses
Projected Offering: Spring